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CONTENTS

PAGE

DISPOSITION OF APPLICANTS FOR ADMISSION TO SCHOOLS OF MEDICINE FOR 1926-1927. *Burton D. Myers* ---- 97

DISCUSSION ---- 102

A PLEA FOR THE FURTHER EXTENSION OF CLINICAL OPPORTUNITY INTO EARLIER YEARS OF THE MEDICAL COURSE. *Hugh Cabot* ---- 105

DISCUSSION ---- 108

TEACHING OF MEDICAL ECONOMICS. *Albert T. Lytle* ---- 115

PERIODIC HEALTH EXAMINATIONS. *John M. Dodson* ---- 124

DISCUSSION ---- 126

TEACHING BY AND FOR CONFERENCES. *J. B. Miner* ---- 129

CLINICAL CLERKSHIPS IN MEDICINE. STUDENT UNIT SYSTEM. *John Walker Moore* ---- 136

THE WOMAN AS A STUDENT IN MEDICINE. *Arthur C. Curtis* ---- 140

TEACHING OF OBSTETRICS IN STANFORD UNIVERSITY SCHOOL OF MEDICINE. *Alfred B. Spalding* ---- 149

SOME ASPECTS OF MEDICAL EDUCATION AND PROCEDURE. *Charles F. Martin* ---- 152

EDITORIALS ---- 164

NEWS ---- 168

ABSTRACTS ---- 177

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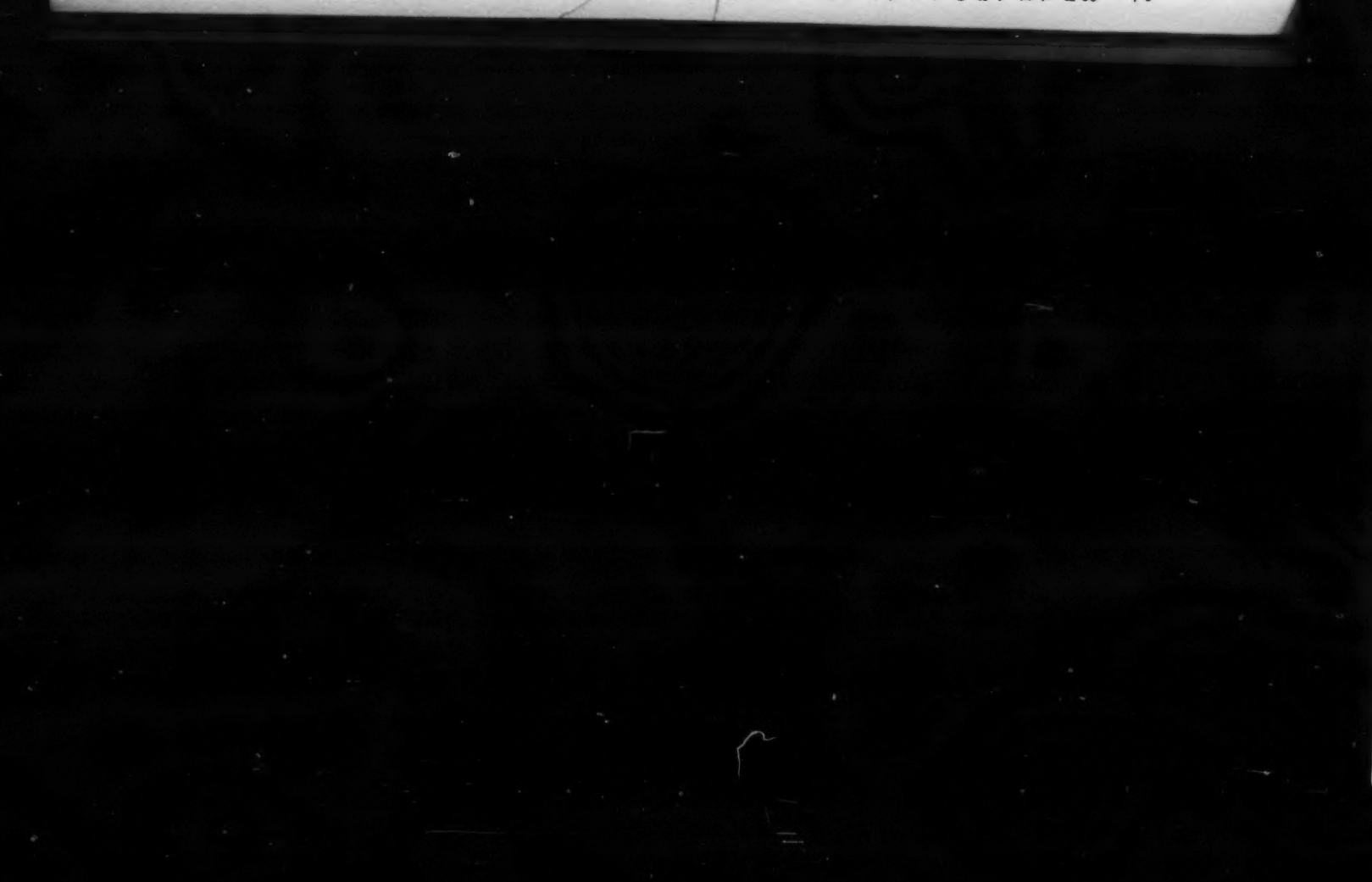

DISPOSITION OF APPLICANTS FOR ADMISSION TO SCHOOLS OF MEDICINE FOR 1926-1927*

BURTON D. MYERS

Indiana University School of Medicine

In order that you may have some understanding of the dependability of the results obtained by this study, I want to outline briefly what was done in the way of getting these figures. Very early in the year, notices were sent to the different schools, stating the purpose of this study. The preliminary notice carried 100 cards with the request that additional cards should be called for as needed. In a very considerable number of cases, as the needs arose, additional cards were asked for and sent.

The report which I have here is made up of two elements. The information relating to refusals is built up from returns on these cards. The part dealing with applications and acceptances, is built up in part from the cards and in part from tabulations made by the schools, unsupported by cards.

All told, about 25,000 cards were called for. Of the last 3,000 cards printed, only 100 remain.

The number of applications is much greater than we had anticipated. The total exceeds 20,000, but that does not mean that there were 20,000 applicants. We must distinguish clearly between applications and applicants.

As the cards came in, the returns from each school were analyzed. It was necessary to discard 50 cards, 2 per cent, from the reports. Perhaps that is not greater than should have been anticipated. About 50 of these cards were thrown out because they were applications for advanced standing, which problem was not to be included in this study at all. About 150 cards were thrown out because on the card their disposition was not checked, merely the annotation, "no credentials submitted". It seemed obvious that these 150 cards represented mere inquiries with not even unofficial statements of work completed on which a refusal might be based. Some cards were thrown out because they were duplicates; that is, on the list of a certain school the same card or cards appeared twice. All told, there were about 300 duplications of this sort.

The returns from each school were carefully analyzed. My

*Read at the Thirty-seventh Annual Meeting held in Cleveland, Oct. 25-26, 1926.

stenographer prepared mimeographed blanks, fifty dots to the row, and it made an easy check of the returns of the schools, and an easy way of adding up the check. These checks, a page for each school, gave the subject matter for this chart.*

———————— School of Medicine

Disposition of Freshmen 1926-27

ACCEPTED

Matriculating for first time	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----
Repeating freshman year	----	----	----	----	----	----	----	----	----	----

REFUSED

Failed in another school	----	----	----	----	----	----	----	----	----	----
Class full	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----
Recommended apply next year	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----
Qualitatively inadequate	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----
Quantitatively inadequate	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----
References unsatisfactory	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----
Interview unsatisfactory	----	----	----	----	----	----	----	----	----	----
	----	----	----	----	----	----	----	----	----	----

*Chart demonstrated at meeting but not reproduced here since the tables give essential summary of facts.

Finally, after each set of cards from each school had been alphabetized, the 75 sets making up the thousands of cards returned were alphabetized as a whole. I had two eight-foot files made and these cards were all arranged in these files. This was necessary because one of the objects we had in view was to see how many times individual applications were duplicated.

An alphabetical list of the applicants was then made and after each name an annotation of the number of times accepted and refused.

JOHN DOE, a 1, r 6

From this alphabetical list it was an easy matter, with adequate clerical help, to compile the tabulation shown in tables 1 and 2.

Table 1 is a summary of all applicants ultimately accepted.

TABLE 1

3777	applied	to	one	school,	a	total	of	3777	applications
795	"	"	two	schools,	"	"	"	1590	"
311	"	"	three	"	"	"	"	933	"
159	"	"	four	"	"	"	"	636	"
86	"	"	five	"	"	"	"	430	"
70	"	"	six	"	"	"	"	420	"
48	"	"	seven	"	"	"	"	336	"
35	"	"	eight	"	"	"	"	280	"
18	"	"	nine	"	"	"	"	162	"
16	"	"	ten	"	"	"	"	160	"
11	"	"	eleven	"	"	"	"	121	"
7	"	"	twelve	"	"	"	"	84	"
4	"	"	thirteen	"	"	"	"	52	"
5	"	"	fourteen	"	"	"	"	70	"
4	"	"	fifteen	"	"	"	"	60	"
1	"	"	sixteen	"	"	"	"	16	"
2	"	"	seventeen	"	"	"	"	34	"
5349								9161	

Table 2 shows how many applicants were refused.

TABLE 2

2479	applied	to	one	school,	a	total	of	2479	applications
518	"	"	two	schools,	"	"	"	1036	"
215	"	"	three	"	"	"	"	645	"
137	"	"	four	"	"	"	"	548	"
87	"	"	five	"	"	"	"	435	"
42	"	"	six	"	"	"	"	252	"
26	"	"	seven	"	"	"	"	182	"
30	"	"	eight	"	"	"	"	240	"
11	"	"	nine	"	"	"	"	99	"
16	"	"	ten	"	"	"	"	160	"
10	"	"	eleven	"	"	"	"	110	"
6	"	"	twelve	"	"	"	"	72	"
2	"	"	thirteen	"	"	"	"	26	"
3	"	"	fourteen	"	"	"	"	42	"
1	"	"	fifteen	"	"	"	"	15	"
1	"	"	seventeen	"	"	"	"	17	"
1	"	"	nineteen	"	"	"	"	19	"
1	"	"	twenty	"	"	"	"	20	"
3586								6397	

There was a total of 20,093 applications, not applicants. There were about 8,500 applicants; that is, each man, on an average, applied two and a half times. Of those 20,000 applications, 6,420 were accepted. Of those accepted, 154 were repeaters, not a very large number for the number of schools represented.

However, when we came to the record of enrollment, we found that there were only 5,019 enrollments. That seems to me a rather important matter. There are 6,420 acceptances and only 5,019 enrollments, a difference of 1,401. That means that 1,401 of the 6,420 had applied and were accepted in two or more schools, and you did not know when those men's names were on your list whether it was your school or some other school to which they were coming. Fourteen hundred is almost 25 per cent of the entire enrollment, and it is a number so high that in these days when place in schools is so eagerly sought it is a matter of great unfairness that that place should be held by men who do not intend to accept.

That problem has been solved by a number of schools by requiring a deposit of a size sufficient to discourage double matriculation. One school, the University of Pennsylvania, I think, han-

dles the problem in the best way. That school requires a $25 deposit on notification of acceptance, and two weeks before the opening of the semester the applicant must file a bond for the fees for the year. If that is not done, then the place is given to some other individual. That means that Pennsylvania and other schools requiring a comparable deposit are assured of their enrollment. They are certain that when the opening day comes a number of places are not going to be vacant at a time when place is so eagerly sought.

Of the group of refused individuals, we find that 210 were refused because of failure in other schools; 3,775 were refused because the class was full; 199 were recommended to apply another year; 271 were refused because the record was qualitatively inadequate; 1,369 were refused because the record was quantitatively inadequate; 188 were refused because the reference was unsatisfactory; 59 were refused because the interview was unsatisfactory; and 315 were refused for other reasons.

In the "Class Full" group I had anticipated that we were going to get our most valuable information. I expected "Class Full" would be used for those cases in which credentials were found adequate but in which the individual had to be refused because the class was already full. Instead of that, "Class Full" became an easy dumping ground for all those who applied after a certain date, regardless of character of credentials or even in absence of credentials. We are not able to say anything about students who were qualified for admission but were refused. If it should be found desirable to continue this study another year, certainly, specific information should be sought regarding those whose credentials were adequate, but who were refused because the class was full.

A heading such as, "Credentials examined, found adequate, refused because class full," would give the information desired. All of these refused groups are made up of applicants who were refused once to nineteen times and did not find a school home anywhere.

Of the total number of applicants who were accepted, 5,349 for whom I have cards, 3,777 applied to one school only. They were accepted on their application to the school of their choice. Seven hundred ninety-five applied to two schools before they got in; 311 to three; 159 to four; 86 to five; 70 to six; 48 to seven; 35 to eight; 18 to nine; 16 to ten; 11 to eleven; 7 to twelve; 4 to thirteen; 5 to fourteen; 4 to fifteen; 1 to sixteen;

and 2 to seventeen. These last were very persistent individuals but they finally got a place.

From these 5,394 applicants we get 9,161 applications.

Among those that were refused, 3,586, there were 2,479 who evidently applied to the school of their choice, were refused, and accepted the refusal. They were not anxious to get in somewhere, anywhere; but wished matriculation in a particular place and when they were refused at that place they accepted the refusal and are probably preparing to come back next year. It is probable that in those cases the refusal contained an explanation or a reason; perhaps there was an inadequacy of credential that the student informed of has gone back to the arts school to remove.

Five hundred eighteen applied to two schools; 215 to three schools; 137 to four; 87 to five; 42 to six; 26 to seven; 30 to eight; 11 to nine; 16 to ten; 10 to eleven; 6 to twelve; 2 to thirteen; 3 to fourteen; 1 to fifteen; 1 to seventeen; 1 to nineteen; and 1 to twenty and then gave up, discouraged. These 3,586 individuals applied a total of 6,397 times. All told, there are 15,608 cards represented in this study and 8,885 applicants.

I share the regret which some of you must experience in that we cannot at the present time answer the question, what becomes of these people who have been refused? The time has been short. Some of you opened your schools on the first of October. But while we are not able to answer that question now, we have this alphabetical list of refused individuals against which a check can be made another year. Perhaps we may get some information regarding the 2,429, some of whom might have been accepted if they had been as persistent as some of the other chaps.

We have here material that can be followed up and that can be kept on file; in fact, I think, it should be kept on file in some appropriate place, so that this list may be compared with the registrations of next year. In that way, the major questions of this problem can be solved by carrying on the study for a period of years.

DISCUSSION

DR. A. S. BEGG, Boston University Medical School: Is there any reason why schools rejected certain individuals?

DR. MYERS: No, there is no uniformity of reason. It all depends on the case. Among the many explanations, qualitative or quantitative inadequacy is most frequently given. Refusal because of qualitative inad-

equacy makes it possible for the applicant to hunt around until he finds some school in which quality of premedical work does not play a big part in evaluation of credentials. I do not mean to say that he can find such places in the membership of this Association.

DR. W. L. NILES, Cornell University Medical School: Is there any definition of the term "application"?

DR. MYERS: A definition was sent to all schools. A bona fide application was defined as one which presents information on which a judgment may be based. It was not defined necessarily as being a transcript of record. Ordinarily, it would be a transcript of record, but if the boy sends in a statement that he has only four semester hours of physics, you know that he is ineligible without seeing an official transcript. Furthermore, it was stated that men who write in saying, "I am a senior in high school and expect to graduate in June and would like to enter your School of Medicine,"—should not be considered as applicants.

DR. J. M. H. ROWLAND, University of Maryland: I think some of the missing reports might be explained if you understood exactly what the school meant in its report. For instance, at Maryland, the application was considered to be an application provided credentials came and the man was investigated. In our registrar's office, a "Certificate of Entrance to Professional Schools," is issued to eligible applicants and a man who is investigated for one of those certificates is considered an applicant. No man who just writes is considered an applicant, unless he has been sent an application blank and has returned it properly filled out. Of those there were 519, I think. Two hundred and forty-seven certificates were issued. The issuing of this certificate declares the man eligible, but he is not considered accepted unless asked by the Dean to send a matriculation fee.

We found that out of 519 men who presented credentials, only 247 were qualified. The acceptance of men is entirely with the Dean, so that here is evidence of a great many men who are classified as accepted but who were not really accepted. I think they were reported as qualified.

DR W. L. NILES: It is obvious that there has been a good deal of confusion concerning the interpretation of certain definitions, particularly as to what constitutes an applicant for admission. Before further study is given to these data it seems to me necessary that this be qualified and that uniformity of interpretation be secured.

I am certain that there has been a great variation in the way in which different schools have interpreted the term "applicant." It is too bad but it is a fact. The effort was made to give a perfectly clear definition. I am persuaded that you do not know what your actual number of applications has been unless you keep some such card index. In my own school we threw out about 100 on the final review who had been considered applicants up to that time.

DR. ROSS V. PATTERSON, Jefferson Medical College: In an analysis of the statistics gathered by the Committee, I think we might very well take into consideration the fact that every medical school probably had a numbe of applicants who fully met the requirements, and who were notified of

acceptance, but who, for one reason or another, did not enter upon the study of medicine in any medical school. In the case of the Jefferson Medical College, I know of eighteen men who made application for admission, submitted acceptable credentials, were notified of acceptance, but who afterward notified me that they were either unable to take up the study of medicine this year, or had decided to abandon the intention altogether. I assume that the deans of other medical schools have had the same experience, and I believe if all these cases were added together, it would account for several hundred of the 1,401 men which, as shown by the study just presented, were accepted for admission to medical schools, but who did not enroll in any one of them.

Mr. Chairman: I should like to move that the Committee making this very interesting report should be continued for the further study of applications for admission to medical schools, and their enrollment. There are a number of additional phases of the subject which it would be profitable to investigate.

DR. J. M. ROWLAND: I second the motion.

DR. C. F. MARTIN: I am sure that everybody here feels that though they may not have said much about it, the debt we owe to Dr. Myers for this wonderful piece of work is indeed great. It is a tremendous work to review some 20,000 odd cards with all the details concerned. I think we are very much indebted to him for what he has done.

(NOTE: The motion was put and carried unanimously.—SECRETARY).

It is obvious too that there will have to be some further investigation as to the terminology and if the committee would be able to consider those points that are brought up it would help a great deal. We have all realized from the large number of applications that come to our schools that there must be many more applications than students. This has been revealed and it has astonished everybody here.

DR. BEGG: Another thing to bear in mind is that there is a difference between a man who is qualified quantitatively for entrance according to our minimum standerd in this Association, and one who is not qualified quantitatively for admission to certain schools in membership of this association.

DR. NILES: Respecting Dr. Beggs' remarks I seem to be on the defensive. In reply I would say that we received some 900 applicants, some 294 of which were finally considered by the Committee. On further study of these some 53 were regarded as deficient in some respect. What happens is that a clerk reviews the original applications and sifts out those that are obviously incomplete before sending them to the Committee for final study.

DR. C. F. MARTIN, McGill University Faculty of Medicine: If this study is continued next year, will you send out a definition of what the terms "applicants" and "applications" mean?

DR. MYERS: I would say that the Executive Council should take the definition already sent out and modify it in such way as to be acceptable to the Council.

A PLEA FOR THE FURTHER EXTENSION OF CLINICAL OPPORTUNITY INTO THE EARLIER YEARS OF THE MEDICAL COURSE*

HUGH CABOT

University of Michigan Medical School

No time, I take it, need be consumed in arguing the assumption that the business of the medical school is to prepare students to be practitioners of medicine. This involves the assumption that the course will develop or attempt to develop certain habits of mind which will qualify the student to deal with the reactions of human beings. It also involves the assumption that during this period of training, some selection will be made of those having the requisite qualities to fit them for the practice of medicine. It is a fair assumption that the product should be an individual of good character, strong personality, a knowledge of fundamental science which will enable him to apply these sciences, and qualified to appreciate the reactions of human beings to their environment. It seems essential that the fact that he is to deal with human beings should at all times be in the foreground and made evident.

The present standard curriculum as laid down by this body is naturally divided into three periods of two years each: the premedical, the preclinical and the clinical. Nowhere in this curriculum is there any requirement which would particularly qualify the student or interest him in the mental or psychological behavior of mankind. In fact, on the whole, stress is laid on the physical side. In practice, more than half of the time is spent in the study of fundamental sciences and in the laboratory.

Nowhere is it clearly stated that the purpose of this enormous requirement on the sicentific side is to develop habits of mind involving accurate observation and ability to draw conclusions from such observations. It almost suggests that the makers of this curriculum desired to produce laboratory scientists rather than clinicians. In extenuation, it is pointed out that this is the period during which science must be studied and that in later life the clinical aspects may be acquired. This argument, of course, has considerable validity but it appears to overlook the fact that this is also a period in the student's life when habits of mind are

*Read at the Thirty-seventh Annual Meeting held in Cleveland, Oct. 25-26, 1926.

formed, and that it may be possible to establish at this time habits which are not particularly desirable in the clinician. It is not impossible that such a training might tend to select from the whole group those who were particularly qualified to approach a problem in a purely scientific way and lack those qualifications which are particularly essential in those who deal with human ills. Certainly, the present curriculum is not clearly fitted to select people of personality and human knowledge as opposed to the abstract scientific thinker.

The present arrangement seems to me to be criticisable on two grounds:

1. That it is pedagogically faulty.
2. That it is humanly faulty.

(1) It is pedagogically faulty on several grounds, among which are the following: If, as is commonly alleged, the purpose of the enormous amount of time spent on medical sciences is for the purpose of teaching methods, it is unnecessarily long. Scientific method is given to the premedical student throughout the bulk of his two premedical years, and the same method is continued for most of the time during the succeeding one and one-half years,—surely a tremendous allowance in which to inculcate this principle. If, besides the teaching of method it is intended to teach a large body of fact, then it is criticisable in that the fundamental principle that fact and application should be closely correlated is largely lost sight of. As a method of teaching fact, it could not, I think, be defended since it not rarely occurs that the facts taught may be separated from any possible application by a period of two or even three years. Again, it violates sound principle in that the whole purpose of the study is obscured and that the student has at least no evidence that he is concerned with the ills of human beings for more than half of his course. This may not destroy his enthusiasm, but it will make his labors infinitely more difficult in that throughout this period of time he is unable to appreciate the relation of fact to application and must attempt to do so often after the facts have become thoroughly stale.

I believe it to be a fundamental principle of sound training that the end and consequently the relation between the various parts should be continuously observable by the intelligent. In no other way, I think, can a sound appreciation of relative values be obtained. We postulate the ability of the student to apply biological principles, physiological and chemical principles and

anatomical and pathological fact to human beings while we make it difficult to see what the relation is. On the whole, the tendency is to increase rather than diminish the abstractions of the fundamental sciences, and again on the whole, they are increasingly being taught as sciences in themselves as if preparing for a further study in these scientific fields rather than in their application to human beings. If the purpose of the fundamental sciences is that they shall be in fact applied to the conditions of the human body, then their teaching as abstractions is not only not helpful in this regard but may actually be a detriment. It is at least conceivable that we might, by diligent training over a period of four years, develop habits of mind in regard to the relation of science to life which would seriously handicap the practitioner of medicine in his effective approach to his future patients.

(2) The course is humanly faulty in that it stresses abstractions and facts without due regard to their human relations. As the course in this country has developed and is, I think, still developing, there is a tendency, at least, to a large amount of teaching with no corresponding amount of learning. With the immense volume of fact which we are now attempting, futilely as I think, to teach, there is at least no certainty that the student will learn. They must all, as the phrase runs, "cover the same ground" in the same time or take the consequences which may even amount to dismissal. We take little or no account of the enormous variation in the acquisitiveness of the human mind and have, in fact, almost dehumanized the process. At no point during two-thirds of the course is there any special teaching in regard to human beings, and by the time the student reaches the point at which he might begin to acquire such knowledge, he is again pressed to acquire facts in such numbers that contemplation is largely impossible.

At an earlier day, most of the training was under the apprentice system, an undeniably sound method of learning. Teaching was little, but, as I think, learning was comparatively much. This system has, in the smother resulting from enormous increase of known facts, gone largely into the discard in the American system though still largely retained in the British. The contact with patients is short, and often here the method is rather one of teaching than an opportunity for learning. We spend most of four years in teaching scientific method and scientific approach in which the laboratory animal is an important factor. Hardly anywhere do we even attempt to teach methods of approach and understanding of human beings. It is not, therefore,

surprising that the recent graduate, as exemplified by the interne, is likely to approach his patient as if he were simply an enlarged and unreasonable laboratory animal. The fact that the patient is human, that his relation to the physician will be importantly affected by that physician's approach and attitude of mind are lost sight of, and this importantly impedes the ability of the recent graduate to get in any relation to his patients which is likely to lead to their understanding.

This springs, I think, directly from our disproportionate teaching of laboratory method, and from the belief which has been voiced by eminent authority that the method of approach of the clinician to his patient should in no particular differ from that of the scientist to his laboratory animal. This attitude has become a very real one in the modern medical student and is importantly responsible for the fact that the community does not always find them sympathetic attendants or sound advisors. The suggestion that these crudities will be overcome with progressive contact with patients smacks considerably of theory and lacks somewhat of a knowledge of the facts.

I believe it to be true that the average interne just graduated from the medical school is a less human person than would be desirable and with less knowledge of the senses and sensibilities of his patients than we might have taught him. This is, I think, the natural and probable consequence of our present arrangement and no other result could reasonably be expected. If we are, in fact, engaged in the business of preparing people for the practice of medicine, they must have longer and more intimate contact with the subject of their study. They must be better prepared to understand the intricacies of the human mind. This can best be achieved by the extension into an earlier period of the curriculum and absorption of a larger proportion of their time in actual contact with human beings and by methods which will lead to the appreciation of the fact that they are human.

DISCUSSION

DR. B. M. RANDOLPH, George Washington University, Washington, D. C.: It looks as if 51 per cent at last is becoming 49 per cent. If the indictment that Dr. Cabot makes against the effect of the first two years of teaching is correct, then the laboratory man and the method of teaching in the laboratories is deficient. I do not know any subject that starts a man out to be interested in human beings like anatomy does.

I have a very strong opinion with regard to the functions of laboratory men in medical teaching, and that is they should be clinicians. I

think the pathologists, the bacteriologists and the chemists ought to be clinical consultants. It can be done and is being done in certain places. Our second year students have plenty to do, and can work with clinical chemistry and clinical pathology on actual clinical material without seeing the patients themselves.

To that extent I am questioning the validity of what Dr. Cabot has set forth in his theory. Another point is that I do not think that the man who comes out of the second year knows any too much about fundamental science as it is. My observation of students over a very considerable period is the same as noted by Dr. Oppenheimer, i.e., the minute you make a clinician of the student he begins to neglect his regular courses.

DR. J. J. R. MACLEOD, Toronto, Canada: The discussion, both of this and of Dr. Emerson's paper, makes me, as a laboratory man, feel that I would like to say something in connection with the problem. I thorougly agree with Dr. Cabot's thesis, that the earlier the medical student comes to realize that he will have to deal with human and not with laboratory animals in his practice the better. At the same time, I think another principle is of equal, if not of greater importance, at least as a guide in the framing of the medical curriculum, namely, that the student should not be allowed to examine and treat patients until he has learned as thoroughly as possible the fundamentals of the sciences which he is to use in the alleviation of human suffering.

Medical practice today, and at all times, as Dr. Emerson's paper brought out, is a consistant endeavor to apply the known facts of science in the treatment of disease. Until those known facts are thoroughly learned, until the principles are completely appreciated, it is quite irrational, quite illogical and quite impractical to expect that the student could apply them advantageously in the study of diseases. However, I think that every laboratory man will agree that the general question that is raised is an important one. The desirability of getting the student to realize early in his course that he is a medical student and that he will have to deal with human beings when he goes into practice, can, I think, be more emphasized in medical teaching by evolutionary rather than by revolutionary changes in the curriculum.

I do not think it would be a safe procedure at the present time to attempt to make a radical change in our methods of teaching. It would be safer gradually to extend into the earlier years some instruction designed to show the student the medical applications of science. We have attempted this to a certain extent, not as yet with entire success, I fear. In the second year of the six year course, which is five years before the student is to graduate in medicine, one of the surgeons gives about ten lectures on the clinical applications of anatomy, and in the third year there are similar lectures and demonstrations on the application of physiology in medicine and surgery. These courses were instituted partly in reply to the various criticisms being made by medical educators, and partly because of the students' petitioning for them.

In the regular courses in anatomy a great deal can also be done by

the use of living instead of dead material. In Western Reserve University an earnest attempt is being made to teach living anatomy rather than dead anatomy. The students examine one another, partly by the use of Roentgen rays, so that they may come to appreciate the application of what they have learned on the dead material in the dissecting room to the living condition. I think that is a very important development.

In physiology, at the present time, I have tried in my courses to bring in the human element by omitting many of the usual experiments on laboratory animals and substituting for them experiments on man himself. A large part of the second semester in the physiology laboratory is devoted to experiments on man. The results are not perhaps so precise as those which might be obtained on more easily controlled laboratory material, but I think the knowledge which the students gain is of greater benefit in fitting them for clinical study.

With regard to psychology, I think it was a sad day when teaching in psychology was eradicated from the medical curriculum. As a part of logic it used to be in many of the medical courses of Great Britain. I believe that a certain acquaintance with academic psychology has an important place in the training of medical students, since they will have to deal with mental problems in medical practice. In Toronto the third year students attend twelve lectures in psychology. The lecturer is a member of the arts department of psychology and he emphasizes especially the psychology of the individual. The present lecturer has been much interested in the recent movements in psychology and is also attached to the psychiatric clinic of the university. He shows the student how psychology assists in the analysis of the human mind, and in the last few lectures points out the application of psychology in psychiatry. Besides this required course, one-third of the class, thirty-five students, may also elect an optional course in psychology and they may continue in this for three years. The first year is devoted to a more extended lecture course in the principles of psychology of the individual. The second year is practical instruction in psychology and the third year is a course in psychiatric problems, including the examination of school children, intelligence tests, etc.

I think that every one should keep in mind that we are falling down in the human aspect of medical education and that we tend to be a little too materialistic in our system of instruction. We should constantly endeavor to get away from this fault and aim at having the student realize that if he does not study the mind as well as the body, the Christian Scientist will undermine his influence in medical practice.

DR. NATHAN P. COLWELL, American Medical Association, Chicago: The problem presented by Dr. Cabot is one calling for a better correlation between laboratory and clinical instruction—a problem that has been given special study in at least two of our medical schools, those of Vanderbilt and the University of Rochester. If there is anyone here from those schools I wish they would tell us something about the results of their efforts. In my last visit to Vanderbilt I noted one phase of the plan

that had been developed. In the discussion of a certain disease in a medical conference the professor of public health was asked to present the public health phases of that disease. In this way there was a co-operation between the teachers of public health and of medicine. The plan likewise provided for a similar co-operation between other teachers. There are doubtless opportunities where a correlation can be brought about between the facts brought out in physiology as compared with the disturbed function demonstrated in the clinic. For many years in most medical schools there has been a close correlation between facts brought out in the teaching of pathology with the signs and symptoms found in the examination of patients. I feel certain that great advances in medical teaching will result from the various measures used in securing a better correlation between the teaching of the laboratory and clinical branches. This is the solution of the problem which has just been presented by Dr. Cabot. We certainly need our scientists and we need our pathologists, but there should be more co-operation between them in devising the best methods of recognizing and alleviating diseases shown in the living patient.

DR. BEVERLY DOUGLAS, Vanderbilt University, Nashville, Tenn.: I do not know whether I can give the information Dr. Colwell asks for or not. Dr. Leathers is in charge of the department of preventive medicine at Vanderbilt. He is having a very active co-operation in his work of teaching from the department of public health of the city and state. He takes the men of the senior class out for field demonstrations in order to investigate the conditions in various institutions. They go in groups to study health departments, sanatoria, dairies, infant hygiene clinics and various other institutions of a like nature. The students are certainly getting a great deal out of this work and I believe an extension of it will go far toward solving the problem of making the student more serviceable to his patient by keeping him in touch with the broader aspects of medicine, especially in their bearing upon public health.

DR. RICHARD V. LAMAR, University of Georgia, Augusta, Ga.: I hold clinics with sections of the fourth year class, just like the other assistants in the department and that brings on co-operation.

DR. EBEN J. CAREY, Marquette University, Milwaukee, Wis: I think we all realize, at least the majority of recent medical graduates do, that there is a tremendous hiatus between anatomy and physical diagnosis. I recognize that in my own education, and I am a recent enough graduate to remember that deficiency. When I began to teach anatomy I attempted to correlate the relationship of dead anatomy, with the body lying in the horizontal position, to the living, normal, human body. The present freshman class at Marquette has finished the dissection of the thorax. While the students are carrying on their work in gross anatomy, as soon as the structure has been revealed and the skin has been removed, the students, in pairs, immediately project the underlying structures on to the skin of a normal living person.

I know in my own past anatomic education, after I got through with dissection, if a clinician called me into the clinical amphitheatre, it was

surprising how opaque the underlying structures looked with the skin intact. We do not wait two years for a course in physical diagnosis. The average physical diagnostician primarily emphasizes abnormality and the student does not have an opportunity to establish normality in his mind.

I feel that the art of anatomy has been lost. I was taught that anatomy was a subject that was learned and not taught. I find that a great deal depends on personal effort and your sympathy and knowledge of the subject of living anatomy. Considerable teaching and knowledge may be gained by the study of the living medical student's body. Sir Charles Bell taught anatomy by the living method. As soon as the body was dissected, immediately a living individual was projected into it, and there was not a long period of time that the individual study of structure was correlated with functions.

It was a sad time when physiology was divorced from anatomy. The pure anatomist became an architect and the physiologist a student of energy and the two were never correlated. The average anatomist does not teach much about the functions of the body, and the average physiologist has little teaching knowledge of the structure of the human body. As a consequence, the correlation of the two are not attempted in the medical curriculum.

I heartily concur with the paper that the medical student should be brought in contact with the living human material earlier and that he should not wait until he arrives in his clinical years.

DR. C. P. EMERSON, Indiana University, Indianapolis: There are so many points in Dr. Cabot's paper that deserve special attention. A few have not been discussed. It is very likely that nobody can understand those things. Dr. Cabot probably can, but I doubt very much if anybody else can, because there are a lot of things we can get only if we are working in the field. Let's bring that down to terms. Give a student the very best you can in general pathology, a splendid course in bacteriology, end up that course with a semester of immunology and of serology, and I do not believe that all the clinicians in America could ever straighten out that boy's mind again. To a certain degree he is spoiled. He is just like a boy who had a nice singing voice but got all kinds of wrong instruction at first so that he was entirely hopeless.

There is a prejudice created there which no amount of clinical work can break down. It is just as clearly a prejudice as in the olden days was the prejudice of the demagogue. If you introduce your patient to the student first and then develop the pathology along with the serology at the end, they then fall into their natural places as tools to use in studying the case. I doubt very much if you train the student well in these preclinical sciences before he goes into the ward, I doubt if you can overcome the prejudice. There may be good medical students who may be able to divorce themselves so that they will not be affected, and the patient will be interesting because he agrees with that which he has already been taught.

DR. IRVING S. CUTTER, Northwestern University, Chicago: At the

Omaha meeting in 1924, Dr. O. H. Perry Pepper read a paper on the correltion course given at the University of Pennsylvania. It was a very well worked out plan. Perhaps Dr. Wm. Pepper will tell us what the result of that course was.

DR. WM. PEPPER, University of Pennsylvania, Philadelphia: It is still going on and is still satisfactory. It is very similar to other courses given in other institutions. The students like it.

DR. E. S. RYERSON, University of Toronto: It is extremely interesting to hear this discussion today. Some few years ago I gave a paper on this problem in Chicago and there was a great deal of discussion of correlation in which sarcasm and cynicism were largely predominant. The change in the attitude of this meeting is a matter of extreme gratification and shows that the effort to bring about a correlation between the preliminary sciences and clinical courses is actually bearing fruit. The attitude of the men who are teaching the sciences, I am glad to say, is to my mind the probable solution to the problem. A certain amount of actual mechanical work can be done with time tables and things of that sort, but the real underlying basis is a development and an education of both the clinical and laboratory men as to the value of the correlation of the two parts of the medical course.

Some of you may have noticed the article by Sir Arthur Keith, the well known anatomist, in a recent number of the *Lancet*, who, in addressing the medical students, pointed out that teaching of anatomy had to be revised so as to teach living anatomy instead of dead anatomy.

The teaching of living pathology was introduced some years ago by Sir Berkeley Moynihan and the value of that in connection with medical courses has been of the greatest value in teaching that subject. Dr. MacLeod has outlined how physiology may be taught as living physiology. All of these changes are unquestionably evidence that active evolution is taking place and that we are arriving exactly at what Dr. Cabot has hoped for, and that he is endeavoring to keep the ball rolling in order to reach a stage in which we will turn out practical medical men.

DR. MCKIM MARRIOTT, Washington University, St. Louis: It is possibly true that 75 per cent of the preclinical work now given to medical students has no immediate practical application. I will grant that. It is quite possible that we could cut down the instruction in the fundamental sciences to one-fourth of the time, allowing a student to spend the greater part of his four years in medical school at the bedside, working under a preceptorial system, and graduate a man with a perfect bedside manner, a thorough knowledge of prescription writing and the dosage of useless drugs. Such a man would be fairly well prepared to practice the medicine of today, but he would be practicing the medicine of today ten years from now. Such a man would contribute nothing to medical progress. With the profession as a whole trained in that way, medicine would come to a standstill.

Those of us who are clinicians have had an excellent opportunity in recent years of comparing two types of physicians—those trained mostly

at the bedside and those having, in addition, an intimate knowledge of the fundamental sciences. The scientifically trained man has demonstrated his superiority from the standpoint of correctness of diagnosis and efficiency of treatment. We have all seen the eminent clinical teacher who prides himself on his clinical observation and discounts the laboratory sciences—a man who receives the admiration of the undergraduate student, yet whose observations are faulty and uncontrolled and whose deductions have been disproved by men of better fundamental training.

What we desire to accomplish is the training of men who will continue their eduction after leaving school, who will comprehend the newer development of scientific medicine and who will be capable of developing medicine of the future—as well as practicing the medicine of today. I should like to enter a counter plea that our professors of medicine be trained in the fundamental sciences rather than that professors of physiology be trained in clinical medicine.

DR. H. W. MACCRAKEN, Detroit College of Medicine and Surgery: I do not believe that there is the extreme segregation between the preclinical and clinical courses which we are constantly told exists. I think they merge with each other with considerable success and smoothness.

DR. HUGH CABOT: Dr. Lyon asked me how I proposed to do it. I cannot answer his question better than Professor MacLeod did. I suggest that MacLeod has done it. My figures have been criticized. I was four months out in my generalization. Instead of being divided into two two-year periods, it might be one and a half and two and a half years, but still a good deal more than half the time is spent in absence of any human contact. Professor MacLeod has pointed out that at Toronto they are getting their contact back a good deal further. They get them back beyond the middle of the course, which, with our standard arrangement, would get them back nearly into the first year of medicine.

I wonder if Dr. Marriott and I really differ so much. He does not believe in the fundamental sciences a bit more than I do. I do not want less fundamental sciences. I do want them correlated. I want relation shown and I do not want what Professor MacLeod has pointed out that we should early interest them in the behavior of the human mind more than we do now.

I am shocked regularly to find how little knowledge our recent graduates, and some not so recent, have of the ordinary behavior of the human animal. Within the last three years I have been considerably interested in the number, which is very large, of people who come to us in various departments in whom an entire misunderstanding of their character has led to unnecessary and harmful surgical operations.

I believe that without at all cutting down the fundamental sciences, we could still introduce them in such a way that they would be more valuable. I have been wondering whether we could use our students' summer vacations to better advantage. A good many of them in the interval between the premedical and the medical years, and between the first and second years in medicine are likely to be working in the laboratory.

I am wondering if that time could not be used to introduce them to human beings—whether we could not apprentice them, more or less, to practicing physicians and let them get the "smell of the thing" a little bit.

Experiments along that line have been tried and they seem to be interesting. I am inclined the think that our concentration is a little to concentrated. I should like to see increases in anatomy. I shouldn't increase it in the first year. I should like to carry it along very much more than now, however. I think the same thing is true of physiology and biochemistry. The relations of pathology are on a sounder basis than most of the other fundamental sciences. I should like to be sure that no student would have his organic or inorganic chemistry three years before he gets his biochemistry. I think that is lost motion. That happens today.

TEACHING OF MEDICAL ECONOMICS*

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Education is knowledge acquired through one's own experience or through that of others. Dr. Nicholas Murray Butler states: "The true objective of education is service". These statements are particularly true of the preparation for the practice of medicine.

It is said that broad general education "comprehends all that disciplines and enlightens the understanding, corrects the temper, cultivates the taste, and forms the manners and habits." Medical education properly carried out should be applied broad general education, plus a large modicum of training in technical dexterity.

From correspondence anent the presentation of medical economics to undergraduates, in answer to the question, "what is your opinion of the value of such talks?" one dean wrote: "In regard to the latter subject, I would frankly state that I do not know what is meant and therefore cannot give an opinion of the value until I have some idea of the content of such talks." The registrar of a school established sixty-six years ago wrote: "You will be interested to know that this college has always taught medical ethics." His bulletin announces that twelve hours are allotted to history, ethics and economics, although the description outlines history alone. Another dean wrote: "I am not sure of the definition of 'medical economics'. I am quite sure the subject is not taught in this school". While the correspondent of

*Read at the Thirty-seventh Annual Meeting, October 25, 1926.

a great college wrote: "For a great many years one or two lectures have been given to the fourth year medical students * * * * on the subject of ethics".

Taking this correspondence as typical of the attitude of all medical faculties, I may be pardoned if I endeavor to define medical economics.

Political economy—economics—is one of the general topics of a broad education. Medical economics applies the broad principles of general economics to the narrow field of medical practice. Fifty years ago, political economy was almost an esoteric subject; today economics is an important part of nearly every commonplace social problem. General economics treats only of questions involving wealth and the satisfying of material wants. Its questions are very distinct from those of morality and ethics and from those of jurisprudence. Its topics include a consideration of the progress of civilization, government regulation, population, money, credit, industry, supply, demand, production, exchange, interest, distribution, socialism, taxation, banking, superintendency, labor, wages, strikes, and, many others.

Medical economics treats of such portions of general economics as particularly influence the welfare and the activity of the physician. In particular it considers such professional topics as medical education, licensure, types of practice, organization; such social topics as public health, sanitation, drug addiction, prohibition, birth control, venereal disease, prostitution, degeneration, marriage, youth, euthanasia, insurance, industrial diseases; and, as well such particularly individual topics as income from practice, accumulation of wealth, investment, expense, fees, accounting.

Proper treatment of such an extensive program would require many hours of study and of reading on the part of the medical student, an expenditure of time and effort entirely uncalled for and inappropriate.

Until 1913 no published medical school curriculum tendered the subject of medical economics to the medical student. Yet somewhere in the scheme of medical education existing prior to the last quarter of the nineteenth century, medical economic problems, as well as principles of medical ethics, reached the medical student either directly or indirectly.

It is more than probable that general reading, street corner discussions, guild meetings and political speeches gave to the "surgeon barbers" and the "doctors of physic" practical acquaint-

ance with economic questions. While economic problems, general as well as medical, national as well as local, surely must have been discussed and argued during the daily intimate personal contacts of the apprenticeship and preceptor systems of preparation for the practice of physic and surgery.

The name "apprentice" was used indifferently to indicate a man being taught a trade or a learned profession, and even was applied to undergraduates qualifying for a master or doctor degree in liberal arts colleges. The apprenticeship indenture contract which covered a period of from three to seven years seems to have been first used about the twelfth century as an integral part of the guild and corporation systems.

In America, apprenticeship in the profession of medicine was adapted from the system of Great Britain; it flourished during the seventeenth and eighteenth centuries in the colonies. It was in vogue in some of the states many years after the Revolutionary period. A well known example is that of the apprenticeship of Benjamin Rush, begun in 1760. Many students of good preparatory education and with ample means to pay for professional tutoring became apprenticed for a term of years. This apprenticeship made a sort of servant of the medical student. By the terms of the indenture contract he was to be taught the science and art of medicine, and he agreed to give all his time and energy to study and to whatever other business interests of his preceptor might be required. As an apprentice he exchanged time and service for instruction not only in technical intricacies of the profession but as well in social, economic and ethical problems involved in the practice of medicine.

To obtain a diploma from a medical school, the matriculant was required to place himself under the tutelage of one or more of an acceptable group of physicians known as preceptors; and, before graduation to present a certificate of such tutelage. Eventually, the apprenticeship system became the preceptor system and a money fee was substituted for personal service. The preceptor stressed technical preparation so it soon followed that social, ethic and economic problems seldom were considered. It is more than probable that the preceptorship is an ancient institution that dates beyond historical into legendary times.

In a recent personal communication, one of the oldest and best surgeons of the United States in discussing the preceptor system that existed when he became a matriculant in 1860 wrote: "All I can say is this; that when I entered the Jefferson in October, 1860, I became a pupil of John H. Brinton and Jacob M. DaCosta

who were brothers-in-law. Brinton took the surgical part and DaCosta the medical. Had I not had these preceptors, I should never have had the opportunity of putting my ear to any chest nor palpate any part of the body. I should never have looked through a microscope. Had I not been their pupil, I should only have been able to hear lectures and attend the medical and surgical clinics on Wednesday and Saturday. When I became a preceptor in 1866, I had pupils of my own, including, for instance, Dr. Weir Mitchell's son. I met them once a week regularly in my office besides having frequent contact with them other days of the week. The fee both with Brinton and DaCosta and also in my own office was always $100.00 per annum."

In colonial times (June 10, 1760), the practice of medicine in New York was regulated by an enactment of the lieutenant-governor, the council and the general assembly which, among other things, stated that the candidate should not be examined by physicians with whom he had "lived to acquire medical information", although a certificate was required of having "attended" the practice of some reputable physician for two years if a graduate of a college, or for three years if not such a graduate.

In 1797, the State of New York passed a law that "No person practising physic or surgery at the time of the passage of the Act should continue to so practise without satisfactory proof to the chancellor, (to) a judge of the supreme court, (to) a master in chancery, or (to) a judge of the court of common pleas, that he had practised for two years next preceding October 1, aforesaid, or had studied that time with a reputable physician or surgeon, and had filed a certificate to that effect with the county clerk".

This act further provided that " no other person should practise physic or surgery without a certificate from one or more physicians or surgeons that he had studied medicine for four years under the preceptor signing the same, and that he was qualified to practise".

There can be but little, if any, doubt that in the apprentice or preceptor relations the principles of ethics and the problems of economics became familiar to the medical student if not by precept then by example.

Gradually medical schools became the only source of technical medical education; they subsequently were regulated by state departments of education. Beginning fifty years ago, the preceptor as a teacher rapidly became obsolete and his certificate merely a form demanded to comply with charter requirements.

The preceptor finally was abolished in New York State by the enactment of the licensure law of 1890.

With hospitals, clinics and dispensaries affiliated with medical schools, with the creation of internships, the personal technical training formerly obtained through the preceptor system has become standardized, if not greatly bettered. The medical schools, however, until very recently offered no substitute for the knowledge of ethical principles and of economic problems directly affecting the practise of medicine secured through apprenticeship relations under a preceptor.

It was not long after the obsolescence of the preceptor before it became evident that the practice of medicine and its practitioners were suffering because the fundamental principles governing ethical and economic relations no longer were enunciated and exemplified.

That the profession considered medical economics an important topic is shown by the formation in New York City in 1912 of the American Society of Medical Economics. Correspondence with the officers and nationally known members would seem to verify this assumption and to indicate that its activity brought about the introduction of medical economics into the course of study advised by the New York State Department of Education.

The Medical Society of the County of Erie (N. Y.) established a standing committee on economics April 20, 1914; other county societies rapidly followed suit. The Medical Society of the State of New York created a standing committee on economics April 26, 1915, which ever since has been functioning actively to the benefit of organized medicine in the State of New York.

Assuming that all are familiar with the functions of the Board of Regents of the University of the State of New York and with its relations to medical schools and to the medical curriculum, there is to be found in Hand Book No. 9 on Medicine issued in June, 1913, in the schedule of "Minimum course of study for medical schools to be registered by the Regents", the following: "History of Medicine; Ethics of the Medical Practitioner; Medical Jurisprudence; Medical Economics, fourth year, 30 hours".

In 1905, the medical school of the University of Buffalo introduced lectures on the subject of medical history and medical ethics. In 1913, the subject of medical economics was added to this group. In 1916, I was asked to develop medical economics as a disassociated subject, and in 1925 the subject was dignified with professional rank.

In recent correspondence with the eight other medical schools of the State of New York, it would appear that quite all are presenting medical history and medical ethics, but that only three of the nine medical schools are giving anything that even resembles medical economics.

My acquaintance with political economy and economics was made through the channels of politics and business. After becoming a physician, the first medical economic problems mainly involved ethical relations with sectarians. Economic problems became acutely interesting along about 1906 at the time of the amalgamation of the State Society and the State Association when I became an officer of the County Society.

Heated discussions over encroachments of boards of health, quackery, advertising, fee splitting, expert evidence, medical legislation, lodge practice and delinquent debtors occupied the time and attention of infrequent society meetings and gave rise to caustic resolutions that produced little, if any, result. In 1914, a workmen's compensation law went into effect in New York state. Insurance carriers put over medical fees and regulated service thereunder that still are causing complaint and agitation and futile attempts at corrective legislation. In the next succeeding years, compulsory health insurance, with its panel practice, annual registration, group practice, industrial medicine, — all vitally important economic problems—pushed their way to the front, demanding attention not only of the officers but as well of the members of medical organizations.

Society and committee conferences, conversations and discussions on economic problems showed quite clearly that the average practising physician had a woeful lack of knowledge of, an inept approach to, and an inability successfully to argue on economic problems, although his income and freedom were seriously jeopardized.

So, when asked to talk to the students on medical economics, the assignment seemed a mission whereby it was hoped to awaken in the minds of the embryo doctor the necessity of becoming familiar with problems affecting the members of his profession and the practice of medicine other than those of diagnosis and of therapeutics.

At the start, out of 30 hours allotted to the consideration of jurisprudence, history, ethics and economics, 4 were apportioned to medical economics, 10 to history, 3 to ethics, and 13 to medical jurisprudence. Not quite disheartened, a talk on contract medical practice was chosen, and even then the subject was merely

skimmed, its treatment confined exclusively to considering workmen's compensation and state compulsory health insurance. This year the course on medical economics is to be allotted 10 hours. The talks require upwards of 75,000 words; they are illustrated rather profusely, by means of a reflectoscope, with pictures, tabular views, graphs and statistical tables. At first an effort was made to have fifteen minutes of forum discussion at each period but repeated efforts proved this approach to be useless.

The entire course is considered under nine heads:—Introduction; Definitions; Education; Licensure; Practice of Medicine; Service; Accounting; Economic Problems; Organized Medicine.

It is perfectly true that this plan is very ambitious and seemingly crowds the presentation of an enormous amount of matter in so short a time that it hardly can be masticated, let alone digested. But, as no examination is required, the presentation becomes a series of lectures from which it is hoped that the student will absorb enough to accomplish the ends sought. As nearly all the matter is in a constant state of flux, it hardly would be just or right to ask the student to become as familiar with the facts and theories presented as an examination would require. As the faculty has determined that the attendance shall be 80 per cent, it is possible to crowd in an otherwise unjustifiable amount of material.

Although nearly ten years have elapsed since the first lectures were given, as yet no physician ever has complimented the course by stating that it had aided him. Notwithstanding, from their attitude I have a feeling that with very few exceptions the students carry away something of value and of use. From experience with practising physicians in their consideration of economic problems, I thoroughly believe that medical schools owe it to their students at least to acquaint them with an outline of medical economics.

I do not think that I am alone of this opinion for in the correspondence mentioned one dean wrote: "We regard the lectures as of distinct value to the student, looking forward to the time when he will meet problems in his first years of practice which a little guidance will help him to solve." While a lecturer on medical economics wrote: "Students seem to appreciate these lectures very much, and I believe they are making a definite imprint upon them."

TALKS ON

MEDICAL ECONOMICS

Introduction

Selection of Medicine as a Vocation
Brief Reasons for Course

Definitions

Policital Economy—Economics—Medical Economics
Wealth: Material—Immaterial
Learned Professions—Trade vs. Profession
Practice of Medicine—Definition N. Y. State Law—"Doc"

Education

Medical Schools in United States
A.M.A. Council on Medical Education and Hospitals
Association of American Medical Colleges
    Commission on Medical Education
Classification Medical Schools
    Recognized—A.M.A.—A-B-C-Nondescript
    Irregular—Quack—Systems of Healing

Licensure

State Examining Boards—Requirements—Reciprocity N. Y. State Law—Regents University State of N. Y.
National Board of Medical Examiners
"Diploma Mills"

Practice of Medicine

Social vs. Individual: Public vs. Private
Types: Government—Civil
Mass Medicine: State Medicine—Definitions: Federal—State—Municipal—Red Cross—"Contract Practice"—Definitions: "Poor Person"
Institutional Practice:
    Hospitals: National—State—County—Municipal
    Classification: General—Special—Homes—Rules—Regulations—Inspection—Admission—Internship—Staff Position—Compensation—Value
Group Practice: Periodic Examinations
Industrial Medicine: Requirements—Value—Opportunity—Workmen's Compensation—Compulsory Health Insurance—Life and Accident Insurance.
Private Practice:
    Classification: General—Special
Fundamentals for Success:
    Location—Personality—Character—Judgment
Life's Sunset?

Service

Aim of Practice—Postgraduate Study—Community

Accounting

Capital Investment: Time—Effort—Money
    Cost: Medical School: Student: Diploma—License
    Equipment: Office—Library—Transportation

Budget:
Capital Charge:
Interest—Amortization—Management
Operating Expense:
Light—Heat—Rent—Insurance—Replacement—Repairs—Supplies
Books—Dues—Telephone—Transportation—Clerk.
Income:
Public Salaries:
Federal: Army—Navy—Public Health—Department
State: Departments—Institutions—Laboratory—School
County: Health—Hospital—School—Laboratory
Municipal: Health—Hospital—School—Laboratory
Industrial: Common Carrier—Laboratory—Lodge—Insurance—Plant—Store—Hotel
Private: Family—Individuals
Medical Society State of New York Investigation
Income Tax Reports—Estimates
Generalization: United States Bureau of Education
Investments: Stocks—Bonds—Mortgages

Medical Economic Problems

Public:
Sickness Incidence Statistics—Advertising—Hospitalization—Dispensary Evils—Public Health—Health Welfare Activities—Nursing—Patent Medicine—Pharmacy
Private:
Basic Service Values
Minimum Service Remuneration
Minimum Annual Income
A Solution:

Organized Medicine

Historical: Ancient—Early—Modern: Religious—Non-Religious: Medicine Men—Augurs—Delphinians—Aesculapians—Hippocratians—Priestcraft—Guilds—Fraternities—Fakers—Companies—Faculties—Colleges—Federations—Societies—Associations—Leagues—Academies—Clubs
Geographic: International—National—State—County—Town Membership—Grouping—Activities
Aims: Scientific—Political—Economic—Social—Sectarian
Types: Professional—Lay—Auxiliary—Charitable: Physicians' Home—American Association for Medical Progress—Public Health & Welfare

New York State

Medical Society of the State of New York: Origin—Corporation—Legalized 1806—Second Largest in World—11,000
Government: House of Delegates—Council
Affiliations: Relations A.M.A.—1882-1906
Activities: Aims
New York State Medical Association: Origin—Schism 1882—Merger 1906
County Societies: Origin—Evolution—Powers—Corporations—Affiliations Aims
Medical Society County of Erie: Origin—Admission—Advantages—Value—Government—Aims—Affiliations

AMERICAN MEDICAL ASSOCIATION

Origin: 1844—Named 1847—First Meeting May 2, 1848 Baltimore—Largest in World—92,000
Headquarters: Chicago, Illinois—Financial Strength
Membership: Constituent—State—Territorial: Component—County-District: Members—Fellows
Government: House of Delegates—Officers—Trustees
Activities: Administrative—Research—Scientific: Councils—Functions—Efficiency: Sections: Bureaus: Legal—Health—Investigation: Publications

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PERIODIC HEALTH EXAMINATIONS*

JOHN M. DODSON

Secretary Bureau of Health and Public Instruction
American Medical Association

I appreciate very much, indeed, the privilege you have given me of coming today as the representative of the American Medical Association to present a matter which I believe to be of importance. I have an informative statement to make, a message, and a request.

As to the statement, I do not need to tell you that preventive medicine in its various aspects is taking a more important place in medical practice year by year. It should be having an important place in medical education, but evidences of this are not as vigorous as I wish they were.

One of the most fundamental things in preventive medicine is the physical or medical examination of apparently healthy persons, followed by suitable advice which is persisted in until the advice is adopted by the patient. At its meeting in St. Louis in 1922, the house of delegates of the American Medical Association committed the profession to this movement. A committee was appointed to draw up a blank form and this was done. It is surprising in view of the large number that have been distributed and are in use and have been used, and of the urgent request that we have made for criticism and comment, that the criticisms and comments are so few.

At that time a brief report was presented by Dr. Emerson calling attention to the history, the short history, of this movement and making suggestions, particularly as to the physical examination part of this service. This served as a guide book of

*Round Table Conference; Thirty-seventh Annual Meeting, October 26, 1936.

instructions for a year or so. Then, in 1924, a subcommittee which I had appointed,—by the authority of the Board of Trustees to revise the blank, made some revisions.

This committee also undertook the preparation of a manual of suggestions. The business of promoting this movement was made a function of the Bureau of Health and Public Instruction. It was obvious that it involves, first of all the education of the profession of these two groups, the undergraduate student and the practitioner already in practice; secondly it involves the education of the public as to the value and importance of this service.

It was decided at once, (and the trustees agreed) that we need not worry about the education of the public; that was taking care of itself fairly well, but the important thing was that the profession should be prepared to render this service adequately when it was called for.

Three years ago, immediately after the adoption of the resolution in St. Louis I sent out letters to the deans of all the medical schools calling attention to this matter and urging that provision be made for proper instruction of the undergraduate student as to this movement. I also addressed letters to about a hundred selected hospitals, calling attention to the fact that they might serve a very useful purpose by offering post graduate courses in this particular kind of activity.

The response from the medical schools was disappointing. About twenty-five deans deigned to reply and of these some six or eight were actually doing something. Some of them were indifferent and most of them hoped that something would be done but had taken no steps to do it. The replies from the hospitals I did not expect would be very encouraging but quite a number replied that they would endeavor to prepare courses of that sort.

There has been an improvement since that time and indications are that during the last year some of the medical schools have undertaken to inform their students regarding this matter.

It is not a matter of mere physical examination. We assume that students in all medical schools are taught the fundamental principles and are given a reasonable amount of training in the physical exploration of the body by various means. What they are not taught is the matter of eliciting a careful, detailed story of the client's health, that is, his personal and family history, the reviewing of the findings of the physical examination and the history, and then the formulation of advice that will be of real service to that client and will lead him to return for other examinations because he feels he has obtained value received.

At the University of California a clinic was established for this purpose in connection with the department three years ago. I believe it is still in operation. Very recently at Vanderbilt University Dr. Leathers of the department of preventive medicine, has made this manual a required text book for all the pupils in the senior class. They are expected to read it and to pass an examination on it. They are given an opportunity to practice this kind of work in their clinical years. So much for the information. The family doctor it is said is passing. I don't believe that most of us are willing to agree to that. I don't believe you are willing to agree that the practice of the future must be wholly a practice of specialism and of groups. Such a scheme is absolutely impossible in the smaller communities. There is no question but that the general practitioner, the family doctor, can greatly enlarge his field of usefulness if he will become at the same time the health advisor of his clients. They are eager for and are willing to pay him for this service. But, unless he is trained to give that service in the proper way this movement cannot progress.

You gentlemen in the medical schools are lagging behind the profession in the matter of preparing the young men who are to do the medical practice of the future to attend to this particular service and to realize the importance of other phases of preventive medicine. That is my message. My request is that when we again send out a brief questionnaire to find out how much progress has been made in three years you will give it prompt attention. I do urge very strongly that the schools make more adequate provision for teaching preventive medicine. It does not require very much time. It is not a matter of special courses or of injecting anything new into a curriculum already overloaded. It is a question of an attitude on the part of the members of the faculty. Preventive medicine is not so much a subject as it is a state of mind.

Unless we teach our students their responsibility in the matter of preventing disease we are failing to give the people whom they serve the full benefit of modern science.

I would urge that you consider this question and in the future make more adequate provision for it than has been made in the past.

DISCUSSION

DR. HUGH CABOT, University of Michigan: I would like to ask Dr. Dodson if these pamphlets are available? He says they have been pre-

scribed for a textbook and I was wondering whether they were available to the medical schools in a reasonable way.

DR. DODSON: About 300,000 copies of the blank have been sold. The demand is increasing and we are sending out about 2,000 a week. The manuals have been supplied to about 62,000 members of the American Medical Association, largely through statewide distribution. They are for sale to anyone who wants to use them at 20 cents the single copy, $8.50 per hundred and $80 per thousand copies.

It is not an expensive proposition, as you can see. As a matter of fact, if any school felt that it was unequal to this expense I should be delighted to consider the proposition of doing a little charity work.

The blanks are sold at 75 cents a hundred, or less than 1 cent apiece.

DR. WM. DARRACH, Columbia University: Three years ago we started a course in periodic health examinations, a practical course. One hour was given to each student in each of his four years. Each medical student, each year has a periodic health examination carried out by a single man in the medical department.

DR. L. S. SCHMITT, University of California: At one of the conferences on medical education held in Chicago by the Council on Medical Education and Hospitals of the American Medical Association, I reported on the activities of the University of California Medical School. I might, however, again refer to it briefly.

About three years ago we organized a "Health Clinic" as one of the activities of our department of medicine. In conjunction with it we have used both this pamphlet and the blank forms supplied by the American Medical Association. The pamphlet is used for instructing our students.

In every medical school, much is carried on along these lines at the present time. As Dr. Dodson has remarked, it is the state of mind related to this subject rather than the condition which confronts us. We all have carried on for some time a "well baby" clinic and a "prenatal" clinic. Many of us have examined, physically, our medical students. In our annual examination of medical students, we have found that about 51 per cent present defects of structure or function. We have also carried on annual examinations of the employees of our hospital and medical school.

These activities all follow with the idea of a periodic health examination and it is only a question of getting the student to understand the importance of it. It has been found difficult to obtain physicians who are trained in giving instruction to adults who are not frankly sick, nor is it easy to get medical students to acquire this "state of mind." There is a big difference in the care of persons who present themselves with a complaint and giving advice to apparently healthy adults.

DR. DODSON: Reference has been made to students examining each other. A fellow student is good material on which to practice making physical examinations, but the really important part of this service, which the student fails to get, is the eliciting information about the family

and personal history, the working and living conditions of the person examined, and impressing on that individual the importance of changing many of these habits and of living according to certain standards.

Furthermore, he needs to be taught, if that is possible, or to have impressed on him, the importance of saying those things to the client in such a way that he will follow the advice given. It is a very easy matter to tell an overweight man that he ought to live so an so, that he ought to cut down on his diet and to exercise, but nine times out of ten, one can be pretty certain that he is not going to do it. How is the doctor going to pass out that advice so that it will impress the individual so that he will follow the proper health lines? These students should be required to examine people other than themselves.

DR. CHARLES F. MARTIN, McGill University: It may interest Dr. Dodson to know that in Canada we have taken this matter very seriously. The Canadian Medical Association during the last year had a committee which was interested in this work. I am chairman of that committee. One of the problems we are discussing most seriously is the question as to the ability of the average practitioner to make such an examination.

I cannot quite agree with those who think it is an attitude of mind on the part of the profession and the public. I think it needs a great deal of skill to be able to decide that the body is normal or otherwise. The searching examination that is required for periodical health examinations means having a good general knowledge of many things other than mere clinical medicine. It means a knowledge, too, of the specialties, in a way that is very often not covered sufficiently by the general practitioner. However, we are going to do our very best to promote the idea, and I think within the next year Dr. Dodson will find that Canadians are sympathetic with the whole movement.

DR. KENDRIC C. BABCOCK, University of Illinois: At a conference this morning the question was asked how many medical schools are practicing precisely the thing which is here being discussed, by giving a thorough medical examination to all their entertng medical students. In the group who were speaking, not a single one was representing a school that had any kind of a general examination for the entering student. Many of the colleges and universities are requiring a good medical examination, not merely a physical examination at registration time, from every student who comes into the institution. The premedical students thus at least have a notion what a medical examination is. Whether that is conducted periodically or not they have a little insight into what it is.

I think the medical colleges might have such an examination and practice on their own students to begin with and then find out whether they are prepared to continue the examination or not.

DR. SCHMITT: The University of California requires a physical examiation of every applicant.

DR. BABCOCK: I am glad that one medical school is beginning to practice that.

DR. M. C. WINTERNITZ, Yale University: We also do that.

DR. E. S. RYERSON, Toronto University: So do we.

DR. W. T. SANGER: The Medical College of Virginia began last year to make physical examinations of entering students.

DR. ROSS V. PATTERSON: Jefferson Medical College has done that for four years. It amounts to an examination of every student who enters the college.

DR. LOUIS B. WILSON, Mayo Foundation: At the Mayo Foundation we not only examine every graduate student who comes, but his acceptance is contingent on his passing a successful physical examination. We examine our own faculty every year. They are all under one blanket insurance. Unless they are examined they cannot obtain the insurance. I would suggest that you begin with your faculty.

DR. A. C. BACHMEYER, University of Cincinnati: We have a thorough health service among the students. We employ a physician whose duty it is to look after the health of the students and nurses. I want to make a few remarks converning the attitude of the general practitioners concerning periodical health examinations. It has been my pleasure, in the last year, to address two groups of general practitioners. One group was in a neighboring Kentucky town and one group was in an Ohio county. One meeting consisted of about 100 physicians and the other of about sixty. The reactions from the discussions were two.

In the first place, immediately after the talk, there were half a dozen men asked where they could get "courses" on the method of procedure and how to conduct these health examinations.

The second reaction was "How are we going to find time to do it?" This came from the younger men.

These two reactions were interesting to me because of the efforts we are making to promote this program.

TRAINING BY AND FOR CONFERENCES*

J. B. MINER

University of Kentucky

An experiment in teaching which we have been trying at the University of Kentucky seems to have come to the attention of your program committee. The course was entitled Conferences on Life Interests. Since the experiment was undertaken at my suggestion, I have been asked to present it here.

In order to get quickly to the heart of the matter, let me de-

*Round Table Conference; Thirty-seventh Annual Meeting, October 26, 1926.

scribe what I mean by a conference, so as to raise the question of the need for such training. A conference is a discussion by a group of people who attack a problem by cooperative thinking. In its simplest form, a conference is serious conservation. Its common form is the committee meeting. In its highest form the conference is a procedure for reaching important decisions on educational, industrial or other social problems which can not wait for scientific research. In all forms the conference gives practice in thinking which contrasts with that of the lecture and quiz or the ordinary textbook and recitation exercise.

The conference procedure assumes that group thinking is possible. It attempts to bring together wider experience and more varied viewpoints in the expectation that the conclusions will be more inclusive and more far-sighted than those of a single individual. Its advocates declare that many problems today are too complex for one mind to solve. They anticipate that advances are more likely in the future through the combined thinking of groups in which the individual learns to subordinate himself and his opinions to a joint solution.

The medical profession uses the group conference more frequently, perhaps, than does any other profession. Every consultation of specialists is a conference which moves quickly to the decision of questions which often involve life and death. Moreover, the conference is essential for cooperative research and often determines the fruitfulness of the research. Physicians and surgeons might naturally become early interested in the question of training for conferences and of improving the technic of the conference procedure.

Before describing the Kentucky experiment, and as a means of enlisting your interest in the problem, let me call your attention to certain evidences that the times seem to be ripe to consider the best methods of conducting conferences, of training by conferences and of training for conferences. The conference class has had forerunners for a long time in the efforts of certain educators to urge teaching by the discussion method. The work of the McMurry brothers at teachers' colleges is an outstanding example. Apparently, the first college course directly related to giving conference practise was that at the University of Kentucky in the spring of 1924. It has been repeated the second semester of each year since. In December of 1924 and quite independently a similar spontaneous interest in oral discussion was shown by what has come to be known as the Inquiry group in New York City. It looked to the conference as a means of mak-

ing progress in case of social controversies. With that end in view, it arranged for the first "Conference on Conferences" which was held in Asbury Park in the summer of 1925. This was followed by a second Asbury Conference the past summer. These meetings promise to become annual affairs. The New York group issues every few months a publication on the methods of the conference, entitled "The Inquiry." The interest of the Inquiry group has continued to center on the introduction and improvement of the conference discussion as the most immediately promising procedure for attacking the vexing conflicts in the spheres of religion, of industry, or racial adjustment, and even of international controversy. In social conflicts emotional adjustments in the group must receive more attention than in concerted scientific thought. The technic for relieving emotional prejudices is, therefore, emphasized. This social movement shows the broad bearing of the problem of group thinking.

The technic of the conference has been most elaborately studied by the Inquiry group. In its booklet entitled "Creative Discussion" the methods of procedure for conferences have been carefully described as the result of its experience. At its suggestion, the method has been tried for religious conferences in various centers. Its technic has even been tested in thinking through industrial situations. The latest effort in improving such social conferences is to set up at Columbia University a four months' training course for leaders of conferences.

A reference to a description in "The Inquiry" of the method of discussion will show how closely alike everywhere is the process of cooperative thinking. Let me excerpt a few statements from a paper headed "Debate is not Discussion". One might wonder whether these statements did not characterize the contrast between the procedure of attorneys in a court-at-law and the procedure of physicians in a consultation. Let me quote: "A conference begins, not with a proposal calling for a show-down of choice, but with a fresh look at the whole situation from different points of view . . . It hopes to achieve not a winning vote, but a solution, a way of joint action that will enlist everybody concerned . . . The speakers are not to master opponents but to master a situation . . . A debate lines the speakers up on two sides. Naturally the dispute is thus set for a deciding vote by which one side will win and the other lose. Both sides, therefore, look at the issue not as a problem but as a battle."*

In life situations, conferences, more or less serious, are of

*"The Inquiry", January, 1926.

common occurrence, but debate and recitation are rare activities. And yet training for debate gets into the curriculum, training for examinations and recitations is the universal practise of colleges. Mathematics and the languages have their distinctive methods, but on the whole the time of students outside of the laboratories and clinics is occupied mainly in exercising the ability to listen to lectures and to reproduce them. The laboratories offer little chance for discussion and the clinics are usually arranged only for observation. If one hunts through the curricula and observes the activities within college walls, where does he find practice in discussion? It survives today most extensively in the small class in the small college. We may note also the efforts at Princeton and elsewhere to adapt the Oxford teacher-student conference to American conditions. Discussion is common in the advance seminars, but these do not reach the rank and file of the students. A few professors, like Kilpatrick at Teachers' College, Columbia University, are valiantly endeavoring to re-introduce class discussions in large classes by having different aspects of a problem studied and presented in the class period by subgroups. It is rare, indeed, that a professor in a large institution today has retained any distinction in his mind between instruction and education. Memory practise, not thinking practise, seems to dominate our classroom procedure.

Vague thoughts like these were in the minds of a group of faculty members brought together by Dean Paul P. Boyd of the College of Arts and Sciences at the University of Kentucky. As a result, we decided to try an experiment of arranging discussions by small groups of students. There was a conviction that students constantly needed in life the ability to join in serious-minded discussions on vital topics. We were doing, it seemed, almost nothing to train them for such oral interchange of ideas, information and points of view. Training to think and to express themselves by such discussion was our primary purpose. In the minds of a few, however, there was also the notion that training by conferences was the best possible means of training for conferences. We had been impressed during the war with the large usefulness of the conference method under which scientific thought and knowledge had been quickly adapted to the new problems raised by the war. Were it not for these fundamental ideas lying back of our somewhat awkward pioneering experiment, the actual experience at Kentucky with its conference course would hardly justify consideration.

What we have done has been to offer to sophomores and juni-

ors a 1 credit course in which the class was divided into groups of about ten students who met once a week for discussions of serious topics. The first year each department was asked to recommend students who, it felt, would profit by the course and a hundred students were enrolled. Since then about fifty students have taken the course each year without any new appeal to the faculty's or students' attention. The course is classified in the department of English, although instructors are enlisted from other departments. Since the method of training is still in a formative stage, the registration is quite adequate for the experiment.

At the beginning of the semester each student is given a mimeographed page on each topic to be discussed. The page includes a stimulating introduction, a list of references for reading and a series of questions bearing on the topic. The striking feature of the hour is that the instructor who meets with the group is expected to keep out of the discussion. The responsibility is thus thrown on the students. They, not the instructor, get the practice in oral expression and in thinking. The last five or ten minutes of the period is used by the instructor for commenting on the methods of discussion and reviewing the points made.

Each section meets with the same instructor two weeks in succession and then changes to another instructor. At first, the topic was changed eack week, but this year the same topic was continued for two sessions. This permitted more thorough discussion and allowed the instructor to see that his suggestions at the end of the first period were carried out in the next session. At mid-semester the groups of students are shifted so that the same students do not meet together for the entire semester.

Among the numerous topics tried out as promising to be motivated by the students' interests, the following samples show some that have survived: College Athletics; Is Scholarship Worth While?; College Politics; Prohibition; Choice of Vocation and Success; The Character of American English; What Should One Read; The Influence of Sensational Journalism on Community Morals, and To What Extent Are Daily Newspapers Influenced by Big Business?

So far as the technic of discussion is concerned, the main contribution has been an attempt to set forth the ideals of discussion and to see that each student at the beginning of the course went through a self-analysis which was intended to call his attention to those characteristics in which he was weak and

which needed attention. These standards of discussion were formulated by grouping the suggestions of good and bad points about discussions which had been gathered from thirty members of the faculty and advanced students.

The suggestions were grouped under three headings: Preparation for Discussion; The Discussion Itself, and Personal Traits that Count. I can only illustrate a point or two under each. They were published in full in "School and Society" in which I described the course.* Under "Preparation" and the subhead "Knowledge", attention was called to the need for "acquiring a background of important movements and conflicts in the field". Under the subhead "Preparatory Thought" was the direction: "Define the problems raised by the topic. Make a careful analysis of the subject, arranging the points so as to bring out the essentials. Note inconsistencies and think them out". The heading "Discussion" included the subdivisions, "Method of Presentation" and "Expression". Seventeen points under these included such suggestions as: "Remember that the purpose is to arrive at truth. Therefore, frankly acknowledge points made by others. Include an apt example or story, but remember that an illustration may be an exceptional case. Aim at stating an organized point of view rather than a mere opinion. Avoid overstatement, extravagant terms or broad generalizations".

Under the heading "Personal Traits that Count" were the subheadings "Attitude Toward Others"; "Leadership", and "Personality". Illustrative points were: "Avoid contentiousness, sarcasm, irritation. Be modest, not superior or condescending. Cooperate rather than dominate. Be broad-minded with a desire to learn and to grow." It will be noted that these points are directly in line with the cultivation of such attitudes as are necessary also for the proper outcome of important conferences in industry, in education, or in science.

The difficulties in using the discussion method are probably too obvious to require more than a mention. A discussion is always a slow procedure. It is expensive in time for both faculty and students. It is not easily adapted to courses in which the teaching of many facts is essential, although even then the motivation for gathering facts may be more essential than actually setting them before the students. The most serious difficulty is that members of the faculty find it hard to adapt themselves to the discussion procedure.

Our Kentucky experiment has a much more humble ambition

*A New Type of College Course. *"School and Society,"* Oct. 3, 1926.

than the training of conference leaders. It would like to help young people to join helpfully in serious discussion. In doing so, however, it may hint to the students that in after-life, conferences of great moment are only such adolescent discussions grown to full manhood.

As I have followed the reactions of the faculty and the students to this conference course, I have been impressed with three things. By way of conclusion let me state these impressions.

First, students are deplorably ineffective in contributing to a serious discussion. Discussion to them means expressing an opinion, not thinking through a problem. They fail to define the problem, to assemble or to weigh the facts bearing on it. They are accustomed to treat the college as a filling-station rather than a workshop which provides the tools for thinking. In other words, the conference course has brought home to the faculty a realization that students do not know how to think.

Second, with rare exceptions the onslaught of masses of students has changed the members of college faculties from teachers to lecturers. I could name a number of universities where students in psychology are herded in classes of 400 or more and lectured at. When material is presented in a lecture, it is outlined and arranged in a logical order. There is little for the student to do but memorize all he can. When one thinks, the mental process is quite different. A person starts with some zeal for overcoming a difficulty which touches his life interests; he seeks the main point of attack, the main problem; his facts come to him in a haphazard form; his approach to a grasp of the new solution is by a vague idea, not by a clear idea, and his progress is in the direction of criticising and clarifying this vague general notion of a possible solution. The conviction that students' thinking is unskilled has thus been followed by the better realization that the college gives the students little practice in thinking.

Third, almost an ideal method for teaching how to think is offered by the procedure of the discussion. It matters not whether that discussion be in a conference, a recitation, a laboratory or a clinic. If we are to encourage more and better thinking, we need to seek out and reward those rare instructors who have the knack of letting an idea develop among a group of students. Starting with a problematic situation in which the students feel the need for thought, the group should pass by a discussion through a stage of vague ideas to clear ideas. By watching the wheels of a discussion as they grind out a clear idea, the stu-

dents have a chance to observe a real thought process, to imitate it and to practice thinking. At the same time they may learn also to use group thinking as a new tool for intellectual and social progress.

CLINICAL CLERKSHIPS IN MEDICINE

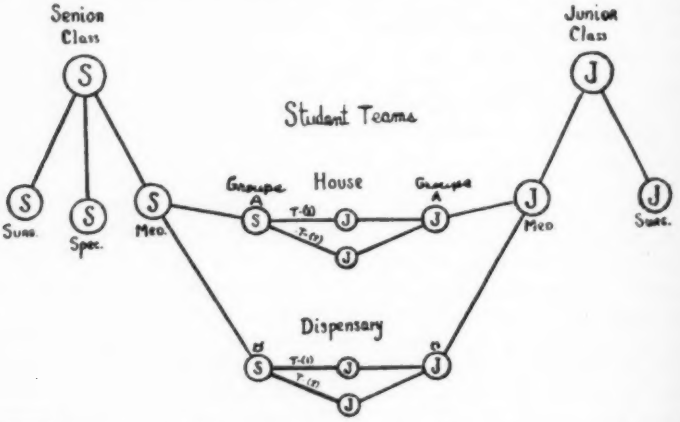
STUDENT UNIT SYSTEM*

JOHN WALKER MOORE

Medical Department University of Louisville

It is conceded that the best method of teaching clinical medicine is by bringing the student into actual contact with the patient, whether it be on the ward or in the dispensary. Ward clerkships, then, have been instituted in all medical schools for carrying out this idea. The problem is met differently in various institutions, and there is no unanimity of purpose in the assignment of cases, the amount of investigation required, or the supervision of this work. In one school we find that the senior clerkships are confined to the dispensary and the juniors to the house, whereas, in another place the reverse will be true.

Furthermore, it is rather a common observation that students serving in the house are well supervised, while supervision



*Round Table Conference; Thirty-seventh Annual Meeting, Cleveland, Oct. 16, 1926.

is woefully neglected in the dispensary; and oftentimes the investigation in the dispensaries is so meagre that it is detrimental to the teaching of medicine and the care of patients. Aside from this, most medical schools have a large visiting staff whose responsibilities in some instances are so vague that many of them lose interest and become dead wood, when those with talent could be used in bringing about an adequate supervision of students.

In the past four years we have tried out various plans of clerkship work, and find that the student unit system, as is to be presented, meets the requirements as no other has done.

Division of Classes for Clerkships.—The Junior class is divided into two sections, medical and surgical. Two hours a day are given to each clerkship. Rotation of sections is carried out in semester periods of 192 hours each.

The Senior class is divided into three sections, medical, surgical and specialties. On medicine, four hours a day are given to this work, a total of 256 hours. Rotation of sections is carried out in trimester periods.

Junior and Senior Clerkships in Medical Division.—The Junior medical division is divided into two groups, A and B. Group A is assigned to the wards and Group B to the medical dispensary for a quarter of the school year. At the end of this time they exchange places.

The Senior medical division is likewise divided into two groups A and B. Group A is assigned to wards and Group B to the medical dispensary for one-sixth of the school year, at the end of which time they exchange places.

Student Units. Assignment of Cases.—The student unit is composed of two juniors and one senior, and such units are in both the house and dispensary. This unit is subdivided for convenience into two teams, one junior and the senior of the unit comprising each team.

Every patient admitted into house or dispensary is assigned to a junior student. This student writes the anamnesis, leaving a two inch margin for the senior student to record the essential abstracts of the junior's history. The senior, together with his junior, makes a physical examination, the former dictates while the latter records the same. The two write an independent clinical impression of the case. In addition, the senior student records a recapitulation of the essential features of the case together with a differential diagnosis.

The senior student in the dispensary has the hour between

8-9 a.m., at which time he has the privilege of consulting references in the library for making a differential diagnosis. On the other hand, the senior student in the house uses the time between 10 and 12 to do the reference work.

The senior student in the house does all the laboratory work on cases assigned to his teams between 8-9 a.m. in the main clinical laboratory, whereas, in the dispensary each student unit rotates through the dispensary laboratory.

SUPERVISION.—(1) In the Wards: Each senior and junior student is required to have his case checked not later than forty-eight hours after the patient is admitted by a member of the House staff. It is the duty of the senior student to arrange with his junior and instructor a convenient time for a bedside conference. The instructor reviews in detail the history, quizzing, criticizing and directing further investigation when necessary. He then enters a grade, which covers aptitude, ability, thoroughness and knowledge. The history so completed becomes a part of the hospital record.

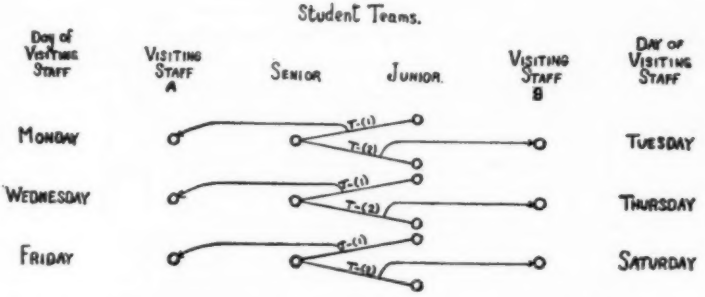
A member of the visiting staff of the hospital makes daily ward rounds with the senior group in medicine. During these rounds a detailed review of the history is not gone into, as a rule, but rather the essential data necessary for diagnosis.

Once a week the clinical roentgen-ray conference is held with the junior and senior groups that are assigned in the house. At this conference the cases that were examined with the roentgen-ray on the medical wards during the week are studied. The junior gives the anamnesis, while the senior on the case gives the physical and laboratory findings and clinical impression. After a discussion by the staff, the roentgenologist makes a detailed reading of the plates and gives his interpretation.

(2) In the dispensary: As in the house, each pair of junior and senior students is required to have their cases checked by a member of the house or visiting staff. The dispensary offers a problem that is not met with in the house, namely, the handling of a large number of patients. As the method of history taking, etc. is the same as in the house, we find that, in the beginning, our raw material, namely the juniors, become swamped in the details of history taking and they know little of what it is all about. Our solution has been to assign one junior to a senior, and the juniors that are left over are assigned to the laboratory and tuberculosis clinic. The senior, together with the dispensary staff, simply nurses the junior along for about a month, after which he is rounded out into such shape that he is capable of

writing a reliable anamnesis. At this stage of the game we draw back our juniors from the tuberculosis dispensary and complete our student units for clerkship work.

In order to keep up keen interest among the visiting staff, we assign to each member two teams and a junior house officer. As the visiting men come on alternate days, there is afforded ample time for the student teams to prepare their cases for checking.



While the visiting staff is going over a case in detail with one team, the junior house staff is rounding up the next team.

Advantages of using students' units in clerkship work may be summed up as follows:

1. The junior student gets the benefit of almost constant instruction from either the senior student, house officer, or visiting staff, thereby making him a very valuable man in his senior year.

2. The senior student, by this arrangement, is enabled to observe and study in detail more cases than by assigning him cases outright to be worked up. And, he is stimulated to do his best when the responsibility of teaching his fellow student is placed upon him.

3. The house and visiting staff, particularly in the dispensary, are likewise stimulated by the arrangement, as they are not so likely to be handicapped by incomplete records, haphazard duties, etc. They are really instructors and are not loaded down with details that tend to take the wind out of their sails.

4. Thorough investigation of cases obviously benefits not only the patient, but the hospital as well.

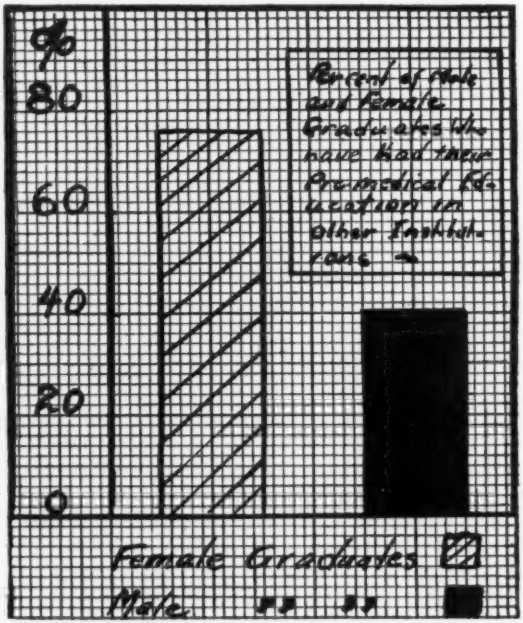
A student unit is composed of two teams T (1) and T (2). When T (1) is checked by Visiting Staff A. on Monday, T (2) is checked by Visiting Staff B. on Tuesday, etc., throughout week.

THE WOMAN AS A STUDENT OF MEDICINE

ARTHUR C. CURTIS, M. D.

University of Michigan Medical School

The University of Michigan Medical School is coeducational, similar to the other colleges on its campus, and allows women to study for the Doctorate of Medicine with the same advantages and opportunities allowed men. It requires only that women meet the same scholastic requirements for entrance as do men, and



maintain a passing grade for each of the courses offered in the medical curriculum.

As Michigan's medical school was the first to throw open its doors to women, it is interesting to determine what women have done in the past, in comparison to men, regarding their training before entrance, their work during each of the four years of study, and their ability to stick out the difficult years of mental

work before their graduation. This report was prepared to obtain an answer to these questions.*

In the past eleven years (1916 to 1926) 924 men and 61 women have been graduated from the University of Michigan Medical School (Table 1). Slightly more than 40 per cent of the men received their premedical work in other institutions, whereas 76 per cent of the female students prepared for their medical education in other literary colleges than University of Michigan (Chart 1).

Table 1 shows that 83.5 per cent of the 61 women graduating from medicine have had, at the time of graduation, some other degree than their medical degree. Only 56 per cent of the men graduating from medicine have had as thorough a literary training.

TABLE I.—An Analysis of the Graduates During the Past Ten Years from the University of Michigan Medical School.

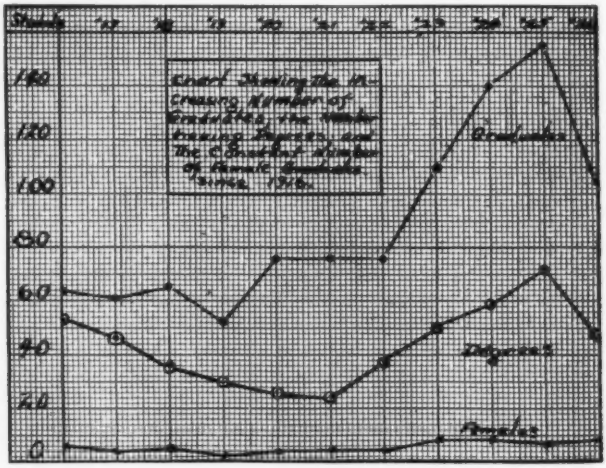
Graduation Year	Graduates Number	Men Number	Women Number	Men %	Women %	Degrees Men %	Degrees Women %
1916	63	57	6	90.5	9.5	82.5	100
1917	61	67	4	93.5	6.5	82.0	100
1918	66	61	5	92.5	7.5	74.2	80.0
1919	54	52	2	96.3	3.7	68.5	100
1920	75	71	4	96.3	3.7	46.6	75.0
1921	75	70	5	93.4	6.6	41.3	60.0
1922	73	69	4	94.6	5.4	42.4	75.0
1923	114	106	8	93.0	7.0	45.6	87.5
1924	140	132	8	94.3	5.7	41.0	75.0
1925	157	150	7	95.6	4.4	46.8	85.7
1926	107	99	8	92.5	7.5	43.9	87.5
TOTAL	985	924	61	93.8%	6.2%	55.9%	83.5%

In 1916, the female students composed 9.5 per cent of the graduating class, but during the period following the war (1919-1920) this proportion fell to 3.7 per cent, a decrease of 61.1 per cent. Male students graduating from medicine during 1919 showed a decrease of 14.3 per cent but with a compensatory increase of 19 per cent the following year. Since the war, the proportion of female students graduating from medicine has been slowly gaining. In 1926 it reached 7.5 per cent, the high mark of post-war female graduations from the University of Michigan

*These figures were compiled at the request of Dean Hugh Cabot.

Medical School. If the graduating students of 1916 to 1922 are taken as a group and compared to the graduating students of 1923 to 1926, it will be seen that the male graduates have increased 94.4 per cent whereas the female graduates have increased 81 per cent. These figures show that the post-war influx of students into our universities not only affected the male graduates from medicine, but the female graduates as well.

In the years before the World War, both male and female medical students were better equipped in premedical training



than in the years following the war. In 1916, 82.5 per cent of the male students had degrees and 100 per cent of the female students had degrees. A recent report, not yet published, shows that the trend of premedical education is again increasing. Entering students with degrees for the past five years have increased 11 per cent over a period of five years directly preceding and students on combined curricula have increased 32 per cent for a corresponding period.

During the war period, the number of students composing the various graduating classes decreased; the preparation for their medical training was shortened to the minimum for entrance, and the number of women entering medicine was reduced. The graduating class of 1921, representing those students entering during the fall of 1917, had only 41.3 per cent bachelor degrees

among its male graduates and only 60 per cent of bachelor degrees among its female students. This was the lowest level reached in premedical preparedness for both men and women during this eleven year period.

Since the war, the proportion of graduates has increased twofold, reaching the high mark of 157 in 1925. Part of this increase was due to the influx of former students who had served as soldiers during the war. The women students did not show a proportional increase. (Chart 2)

During the years of 1920 to 1924, 633 men and 42 women entered on the study of medicine. Of this number, 486 men, or 76.8 per cent, were graduated four years later, whereas 31, or 73.8 per cent of the women were graduated in a similar period. In other words, the proportion of men graduating from medicine compared to the number entering on its study is relatively little greater than is the proportion of women entering medicine compared to the number of women graduating from medicine. (Table 2).

Table 2.—Showing the Number of Men and Women Graduating From the University of Michigan Medical School Compared to the Number Entering.

Graduation Year	Students Entering	Men	Women	Students Graduating	Men	Women	Men Graduating	Women Graduating
	No.	No.	No.	No.	No.	No.	%	%
1923	147	139	8	113	105	8	75.3	100
1924	170	156	14	140	132	8	84.6	57.1
1925	218	207	11	157	150	7	72.5	63.6
1926	140	131	9	107	99	8	75.6	88.8
TOTAL	675	633	42	517	486	31	76.8%	73.8%

During the years 1923 to 1926, 84.8 per cent of all graduating female students and 44.1 per cent of all male students had bachelor degrees. It will be seen from Table 3 that the number of Arts degrees was equal to the Science degrees held by women, whereas the men graduates had slightly more Science degrees than Arts degrees. This is probably due to the fact that fewer women are enrolled under the combined curriculum and also most of the female students in medicine have taken their preparatory work in some other institution, often a school for girls, and have received a literary degree from their former alma mater before entering the medical school. More than one-half of the male students in medicine take their premedical work at the University of Michigan and as the combined course for a Bachelor of Science degree is the shortest, it is more often chosen.

TABLE 3. Proportion of Arts and Science Degrees Held by Graduates 1923-1926 Inclusive

Men:—A. B. Degrees	B. S. Degrees	Total Degrees
%	%	%
21.2	22.9	44.1
Women:—A. B. Degrees	**B. S. Degrees**	**Total Degrees**
%	%	%
42.4	42.4	84.8

All students in the University of Michigan Medical School are graded in each subject by a uniform marking system, in which system "A" means excellent; "B," good; "C," fair; "D," poor, and not passing unless another examination is taken and passed, and "E" a failure. In computing the grades of the students represented in this report, the following system was used: E= —1; D = no points; C — = 1; C = 2; C+ = 3; B— = 4; B = 5; B+ = 6; A— = 7; A = 8; and A+ =9.

Table 4 shows that the general average of all students for four years was slightly greater than the average of all the male students for a similar period. The average of the female students during this same period of four years was greater still than the

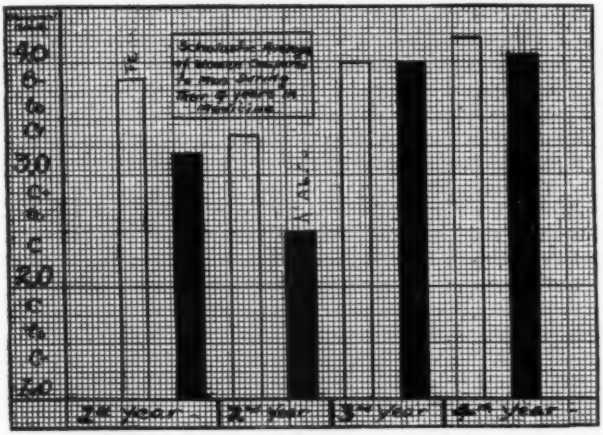
TABLE 4. Showing the Average Grade, by Classes, of the Various Groups of Students in the University of Michigan Medical School

	All Students			Students with A. B. Degrees			Students with B. S. Degrees		
	F. Av.	M. Av.	All Stud. Av.	F. Av.	M. Av.	All Stud. Av.	F. Av.	M. Av.	All Stud. Av.
Freshman	3.78*	3.15	3.19	3.07	3.57	3.51	4.21	3.18	3.31
Sophomore	3.25	2.49	2.80	3.38	3.05	3.09	3.57	3.16	3.21
Junior	4.09	4.10	4.10	4.21	4.35	4.33	3.99	4.41	4.28
Senior	4.36	4.11	4.13	4.22	4.22	4.22	4.50	4.34	4.36
Average	3.87	3.46	3.55	3.72	3.80	3.79	4.07	3.77	3.79

	Students with Either an A. B. or B. S. Degree			Students without Degrees		
	Female Average	Male Average	All Students Average	Female Average	Male Average	All Students Average
Freshman	3.64	3.41	3.43	2.60	3.00	2.99
Sophomore	3.48	3.15	3.18	2.40	2.60	2.59
Junior	4.10	4.31	4.28	3.80	3.92	3.91
Senior	4.36	4.28	4.28	4.00	3.69	3.69
Average	3.90	3.78	3.79	3.20	3.28	3.29

*Each grade represents an average of four classes (i.e. Freshman, 3.78 is the average grade for four separate first year classes.)

average of either the male students or the general average of all students for a similar period. The average grade for female students without degrees was slightly below the class average and also below the average for male students. However, female students with bachelor of science degrees had a much better than average record and also a better record than male students with bachelor of science degrees. Female students with a bachelor of arts degree were slightly below the average grade for all members of that group and also slightly below the average of



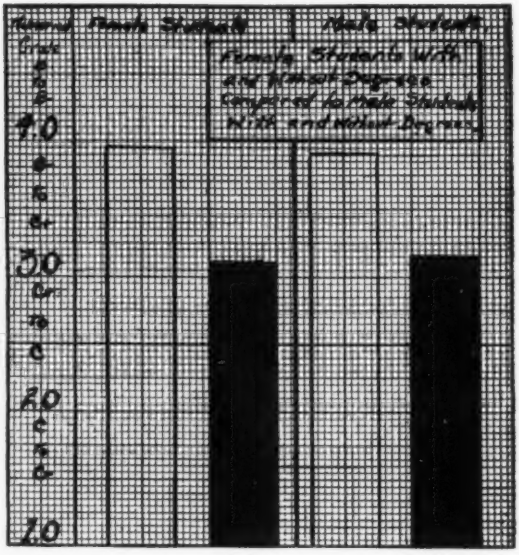
male students with bachelor of arts degrees. Table 4 shows, however, that the general average of all female students with bachelor degrees is greater than the general average for male students with bachelor degrees. Those women without degrees compose such a small group (15.2 per cent of all female students) that their comparison to the group of male students without degrees (55.9 per cent) is hardly a fair one. (Chart 3).

Table 4 also shows that female students do far better work during the preclinical years than do male students. Their average grade during the clinical years is as good as that of the male students. One notices from this table that all students do the poorest work of their medical course during the second year. Whether this decrease in scholastic average is due to a change in the type of work, a feeling of well-being brought about by

successful work during the first year, or more difficult work, cannot be answered from the table.

It is also interesting to note from Table 4 that all male and female students with degrees do vastly better than male and female students without degrees. (Chart 4).

Students, both male and female, with degrees not only do better work during the first and second years of their medical course,



the so-called preclinical years, but they continue this superior work into the last two years as well. One can conclude, then, that medical students with literary degrees are either better trained to study medicine, or as a group, have from the beginning a more scholarly type of mind.

In Table 5, the average grades of male and female students are compiled by groups, (1) Students having been granted an A. B. degree by Michigan; (2) students having been granted an A. B. degree by some other school; (3) students having been granted a B. S. degree by Michigan; (4) students having been granted a B. S. degree by some other institution; (5) students who have

not been granted a degree but who have taken their preparatory work at Michigan, and (6) students who have not been granted a degree but who received their preparatory work in some other university besides Michigan. It will be seen from Table 5 that the male and female groups, which groups have taken their premedical work elsewhere than Michigan, are about equal in respect

TABLE 5. Comparison of the Scholastic Ability of Graduates of the University of Michigan Medical School (Male and Female) Who Have Had Their Premedical Work at the University of Michigan and at Other Institutions.

Grades by Years of Medical Students Who Have Had Their Premedical Education at The University of Michigan.

	A.B. Male Average	A.B. Female Average	B.S. Male Average	B.S. Female Average	No Degrees Male Average	No Degrees Female Average
Freshman	3.73	3.66	3.47	4.00	2.70	3.00
Sophomore	3.26	3.00	3.33	4.50	2.32	3.00
Junior	4.40	4.25	4.20	4.00	3.77	3.00
Senior	4.14	4.00	4.37	5.50	4.25	3.00
Average	3.88	3.73	3.84	4.25	3.26	3.00

Grades by Years of Medical Students Who Have Had Their Premedical Education at Other Institutions.

	A.B. Male Average	A.B. Female Average	B.S. Male Average	B.S. Female Average	No Degrees Male Average	No Degrees Female Average
Freshman	3.47	3.91	3.80	3.90	3.25	2.66
Sophomore	3.42	3.36	3.20	3.10	2.81	2.00
Junior	4.37	4.41	4.00	4.00	3.78	3.33
Senior	4.55	4.41	4.70	4.10	4.00	3.66
Average	3.95	4.02	3.92	3.77	3.47	2.91

to numerical judgment of scholarship. The male students of these groups are slightly better than are the male students coming from the University of Michigan. The average of the female students is also better in the group having taken their premedical work in institutions other than the University of Michigan.

The female students without degrees from Michigan and from other institutions are about equal in scholastic ability, but both groups are far below the average. Male students without de-

grees from the University of Michigan and from other institutions received on an average, better marks than the female students without degrees, but they too, are far below the average.

Conclusions

1. Women compose approximately 6.2 per cent of the graduating classes of the University of Michigan Medical School.

2. Seventy-six per cent of these women and 40.2 per cent of the men have received their premedical education in institutions other than the University of Michigan.

3. Eighty-four and eight-tenths per cent of the women and 44.1 per cent of the men have presented bachelor degrees for entrance.

4. Practically as many women (73.8 per cent) graduate from medicine in proportion to those entering medicine as do male students (76.8 per cent).

5. Female students in medicine do better work the first two years than do men, and their work the last two years is about equal to the male students' work.

6. The average woman student in medicine is numerically about a 10 per cent better student than the average male student.

7. All students reach the lowest ebb numerically the second preclinical year and the highest ebb numerically the last clinical year.

8. Students, both male and female, do better in their medical work if they have received enough premedical preparation to award them a literary degree.

TEACHING OF OBSTETRICS IN STANFORD UNIVERSITY SCHOOL OF MEDICINE

ALFRED B. SPAULDING

Head Division of Obstetrics and Gynecology

The Department of Obstetrics and Gynecology of Stanford University School of Medicine was placed under the control of a full time executive in the year 1912. The executive is assisted by one full time associate and a hospital interne staff consisting of a resident and two senior internes, who divide their year into six months on obstetrics and six months on gynecology. In Lane Hospital there are thirteen teaching beds in obstetrics and eighteen teaching beds in gynecology and at the San Francisco Hospital there are thirty obstetrical beds available however only three months of the teaching year and sixteen bed for gynecology.

To obstetrics and gynecology is assigned the duty of taking care of all female patients who suffer with derangements of their pelvic organs which includes not only all types of pregnancy but all gynecological disturbances as well as urology in women and some proctology and endocrinology.

A fairly well equipped laboratory with one technician is conducted by the full time staff for the study of gynecological and obstetrical pathology, some anatomical dissection and some animal experimentation.

In the Women's Clinic, something over 2,000 new patients are admitted each year with a total number of visits of 12,000. About 300 patients are confined in Lane Hospital, over 300 in San Francisco Hospital and about 90 are confined at home. With this equipment and clinical material, the sophomore, junior and senior classes of about 50 students each are taught obstetrics. In addition, with this limited material, the first year internes at Lane and San Francisco Hospitals and several classes of student public health nurses are trained in obstetrics each year.

To assist in the care of the patients, obstetrical, gynecological and urological and to help teach the medical students and nurses, a staff of practicing obstetricians, gynecologists and urologists volunteer their services. In addition, the head social service worker supervises the three graduate nurses in the clinic

and on outpatient obstetrics in the teaching of public health nursing and in social service work.

When a patient first applies to the Women's Clinic she is registered by the clinic clerk and interviewed by the social service worker. A brief medical history form is filled out and a preliminary pelvic examination is made by the resident interne. If found to be pregnant, she is referred to the prenatal clinic which is held two afternoons each week. Her follow-up card is placed in a folder on the wall which designates in which month she probably will be confined. On this card it states to which hospital she is to go or if she is to be confined at home and an indicator calls attention to the fact that she is normal or suffers from some possible abnormality such as contracted pelvis or venereal disease.

In the prenatal clinic a complete obstetrical history is taken and the obstetrical examination including blood for hemoglobin and Wassermann examination and slides for bacteriological examination from discharges from the cervix or Skene's glands are made by the senior interne. Abdominal examination is repeated six weeks before delivery. Usually 150 patients are registered in the prenatal clinic and at each clinic, about 40 patients attend. These patients are given a practical talk by one of the pupil nurses on public health service. In simple language the nurse instructs them in proper hygiene and in the home care of the baby using dolls and toy dishes to illustrate the best way she might utilize home conditions for the care of herself and her children. When this lecture is over, a sample of urine is obtained from each patient and a chemical examination is immediately made by a nurse. If albumin or sugar is found, the specimen is sent to the clinical laboratory for complete examination. The patient is weighed and then is interviewed by one of the internes who takes her blood pressure and questions her as to abnormal symptoms.

When in labor, she telephones the hospital and is given instructions by one of the junior internes who either goes to her home with a student and a nurse to examine her if she is to have home delivery or else examine her with a student when she enters the hospital. Throughout the first stage of labor she is examined at intervals of several hours and when ready for delivery the students in the college are notified by telephone and if possible they report to the labor room to witness the delivery by the junior interne. The student signs a book in the delivery

room and presents a card to be signed by the interne which makes the permanent record in the Dean's office later to show the number of deliveries attended.

After delivery, the placenta is sent to the laboratory, the baby is weighed and measured and the interne makes out a summary sheet which notes in one column all the pregnancy and labor clinical conditions needed for carding and all operations performed as well as indicating by number who performs the various operations including normal delivery. When the patient leaves the hospital, this summary sheet is sent to the clinic where it remains until the patient calls for her postpartum examination. When finally discharged, this summary sheet is sent to the executive office and the secretary cross indexes on cards all the conditions, operations and operators indicated on the same. This automatically informs the executive of all clinical conditions met with, all operations and unusual treatments performed, all clinical work done by each member of his staff including himself and the mortality and morbidity results obtained with mother and baby.

The same system prevails with outpatient obstetrics and in the auxiliary teaching hospital so that a complete record of all clinical facts in the department can be obtained at any time. These facts are utilized not only for hospital reports but form the basis for student instruction and affords the students many opportunities for the choice of a thesis subject and stimulates the clinical staff in the writing of clinical papers.

Besides two lecture courses, the students are instructed in obstetrical pathology from slides in the department laboratory and are given a manikin course. During their clinic service which consists of daily clinical attendance for four weeks they are instructed in antepartum and postpartum examinations, the treatment of sterility including Rubin's tubal patency test and in routine gynecological diagnosis and office treatments. They must attend at least ten deliveries during their junior year and may elect a two weeks service on outpatient obstetrics when seniors. During their junior year, they attend weekly rounds in the obstetrical and gynecological wards and during their interne service they spend one month on hospital and one month on home deliveries during which time they work in the Women's Clinic.

After finishing their rotating interne service which includes four months on obstetrics and gynecology, the student receives

his M.D. degree and is considered proficient to practice obstetrics as a general practitioner. Should he desire more training, he can apply for senior interne service at Lane Hospital where he serves for six months on obstetrics and six months on gynecology, or at the San Francisco Hospital where he serves six months on obstetrics and gynecology and six months on general surgery. He is then encouraged to spend a year in some other teaching hospital, devoting his time chiefly to obstetrics after which he can apply for the Residency in obstetrics and gynecology at Lane Hospital. During his Resident year, he is instructed in urology in women, in pathology and in operative technic and is given considerable responsibility in the operative treatment of abnormal obstetrical patients and in pelvic and abnormal surgery. He acts as chief attendant in the Women's Clinic, assists in the teaching of students and usually interests himself in some laboratory problem.

SOME ASPECTS OF MEDICAL EDUCATION AND PROCEDURE*

CHARLES F. MARTIN

Dean McGill University Faculty of Medicine

I deem it an honor and a privilege to participate in the program of your Council on Education, and I value the opportunity all the more because of the ever-increasing cooperation which exists, and I trust always will exist, between your great country and the Dominion of Canada.

To set forth the salient points of similarity and difference in the British and American systems of education is not my intention today, but, inasmuch as, in many respects, we are governed largely by the educational activities of your institutions, and are often very directly influenced in our policies by the dictates of your state boards and medical associations, I may be permitted to speak with freedom on some of the vital points with which we, in Canada, are concerned.

I rejoice to realize that we may discuss these important questions under the American flag—symbolic as it is of that

*Read at the Twenty-Second Annual Congress on Medical Education, Licensure and Hospitals, held in Chicago, Feb. 14 to 16, 1927.

untrammelled freedom of thought and action which is characteristic of a great civilized nation.

This very freedom, when linked with great institutions and agencies for the advancement of learning and practice, is destined to culminate in the creation of a better type of medical education.

Nowhere in the world do we find such a capacity for educational development or such facilities for its materialization as in the United States.

Let it be admitted at the very outset that on the general principles of medical education one cannot hope, at this late date, to offer anything distinctly new. In all climes and in all tongues, the broad outlines of the subject have been presented again and again, precluding the possibility of any fresh contribution to the basic aspect of our subject.

It is now fifty years since Billroth of Vienna gave the world his masterly presentation on the first principles in medical education and in the prosecution of a medical career. Scanning once more the pages of this book, I am impressed anew by the comprehensiveness and penetrating insight of his discussions, ranging all the way from the problem of entrance requirements to that of the full-time clinical professorship, and dealing also with the demands for an adequate administration of a medical school. Happily, Billroth's book has been translated into English, so that those who are unfamiliar with German may see how truly the subject of medical education, on its theoretical side, has been exhausted, and that, therefore, fresh contributions can be made in the field of practice alone.

The cause of medical education is seriously handicapped, for while most medical schools concur in the matter of general principles in teaching, few are free from the restrictions of state enactments or from a species of spiritual conceit and chauvinism that block the way to progress in practice. One cannot refrain from noting here the achievements of the Carnegie Foundation under the leadership of Mr. Abraham Flexner, achiements which have been nothing short of epoch-making. Here in the United States, and in Canada, unhampered by traditions that have often checked or retarded progress in countries of the Old World, are to be found magnificent plants and large groups of well-trained men, eager to further progress under competent leadership; and here, too, improved legislation gives evidence of intelligent and far-seeing legislators to further the needs of medical education

still more. With such unique conditions and opportunities, it should be our aim to act promptly, courageously and unanimously, to the end that unprecedented achievements should be scored such as other countries would emulate and be proud to follow.

What are some of the outstanding difficulties that beset the realization of our ideals? Surely, something more than a mere adjustment of our curriculum is essential. In truth, there must be an altered attitude toward the needs and ideals of the medical profession. More especially must there be cooperation on the part of the secondary schools, the universities, the medical faculties, and the profession, and less of an overzealous local patriotism on the part of state legislators.

Only within recent years have we come to realize that the chief problem of our schools is educational rather than medical, and that many of the difficulties are common to all branches of higher education. With this realization has come the investigation of educational methods and the need of experimental study of our curriculums.

Medical education is primarily concerned with the proper selection of candidates to study medicine, and this in turn involves a consideration of the personality of the individual and the training he has acquired in early years. Here is, naturally, our main concern. Here, too, our chief difficulty, not in the United States alone, but in Canada as well. Whether or not the evil at its root lies with the system of school education or the quality of our teachers, I am not prepared to say, but the general average of secondary schools does not appear to confer that mental training and that zeal for scholarship which makes for the ideal medical student.

The young man graduating from the average high school is a mass product, possessed of a certain amount of knowledge, all of the same type, and trained with little regard for his natural bent or his individual gifts or tastes. The accumulation of credits and units of work represents, as has been frequently said, little more than the time spent rather than the quality of work accomplished.

Experience leads one to believe that in Europe or Great Britain, the boy who leaves school has not only received a broader education, but for the better members of each class, opportunities are offered for developing their special inclinations.

Furthermore, while on this continent pedagogical progress

is continuous, we are still far short of the ideal in our standards for teachers in our schools.

The minimal inducement to enter the field of pedagogy explains the cause, and, perhaps, suggests the remedy.

If, then, we are to look forward to a selection of candidates who will be a credit to our profession, we must have, first and foremost, good secondary schools and a very much better type of instructor. The increased number of applications in every medical school today makes it surely possible to aspire to these higher standards of education, but cooperative effort is needed if we are to bring the average school up to the standards of those few on this continent which satisfy the needs of professional education.

In this country, the boy leaving school to go to a university for two or three years of pre-professional study finds little more of education than should already have been provided for in the secondary schools. He is admitted to most of these colleges of arts with ease, for it is the criterion of hours of previous instruction, irrespective of their quality, which for the most part imposes the restrictions on this easy access to a university.

It was originally intended that these years should be something more than mere secondary school training, something which would enlarge the candidate's views as a prospective professional man, give him a background in literature, classics or languages, and some scientific training in the technic of how to acquire further professional knowledge. But, after all, what really does happen? A careful scrutiny of the credits of many of the candidates entering our medical schools reveals all too frequently that they have entered on a career of professional study with a minimum of training, selecting those subjects which most easily enable them to accumulate credits, in quantity rather than in quality—subjects selected not for the sake of the training per se, but because they are the easiest possible road to admission, and so there need not be surprise, at the almost universal complaint that our average medical student lacks the education and mental training to enable him to enter on a satisfactory career, yet, having once gained admission to the medical schools, he succeeds, after years of mediocrity, in qualifying for a degree, and entering on practice with a background that is woefully deficient.

Over the question as to what should constitute the most satisfactory course of pre-medical study in a university, the contro-

versy wages from year to year. Shall these pre-medical years be devoted to scientific subjects or should the classical and other so-called cultural topics be stressed?

There are those who contend that the purely scientific branches have sufficient cultural value, that they prepare the student adequately for the technic of medical study, that two years, at least, should be devoted to each of the subjects of physics, biology and general chemistry. To this they would now add a course of instruction in higher mathematics! Opposing these views is the contention that the purely cultural subjects—classics, literature and languages, should in no sense be sacrificed in the interests of scientific learning.

It would be interesting, indeed, to discover how much on this continent our ideals in education run synchronously with the abandonment of the classics. That students should enter the practice of medicine deficient in English language and composition, that they should be devoid of any knowledge of the derivation of words, without even an elementary knowledge of modern languages, is to me deplorable beyond expression. How few of our medical students really have a working knowledge of French or German? How few to whom the classical derivation of words has any appeal?

The rapid advance of knowledge has apparently made us lose sight of our direction in education. And in our haste to impart facts, we forget the influences that help to mold the students' character and outlook; we lose sight of the fact that cultural interests, on the one hand, and professional interests on the other are best revealed in later life by a well balanced personality.

Dr. John Wyckoff, in his intresting communication on the selection of candidates for a medical career*, has stressed the importance of personality,—which depends not alone on the school or on college education, but on the background of the home—on that inborn something which cannot be learned in a university but has evolved through environment and through inheritance, and which has its important influence in developing the ideal professional man.

It is with this in view that we, at McGill University, are admitting to our first year students in excess of the prescribed number in order that more latitude may be afforded in eliminating in the earlier years those who are lacking not in scholarship alone but in other factors which have to do with personality.

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*Bull. Assoc. Am. Med. Colls. 2:1 (Jan.) 1927.

THE CURRICULUM.—It is obvious that the quality of scientfic training imparted to a young man at a medical school determines in a very large measure his intellectual standard in later years; and it is therefore all important that the curriculum should afford him adequate opportunities for development. The time has surely arrived for our disillusionment as to the amount of knowledge a medical student can acquire in a period of four or five years of study. Recent efforts to overcrowd the curriculum have undoubtedly led to superficiality, to inaccuracy, and so to mediocrity. Our students have thus become machine made, welded all into one pattern, and that not of the best.

Every medical school should maintain a sufficiently high standard in the major subjects; so high as to insure for the average student a sound knowledge of the general principles and technic. If unsuccessful, he must fall by the wayside. An overfilled time-table fatigues the student, and only unfits him for those elective or optional hours of study which might otherwise be devoted to independent work, observation and reading. In our attempt to confer a complete education on the average student, we crowd his time with routine laboratory hours, with specialties and details which not only preclude an adequate intimate practical knowledge of patients, but do not even seem to render him much more scientific.

I cannot but believe as did ultimately President Eliot of Harvard, that the presentation of many organized elective and optional courses defeats to some extent the aim of undergraduate education; all the more so when, an ultimate examination in prospect merely adds to the student's burden. Only by giving the student sufficient latitude of free time in which he may study for himself, either for purposes of review or for advancing his knowledge, is it possible to take care not only of the average student but of the better student as well. Such, at all events, is our experience in McGill, where the better student is enabled in free hours to study for himself and participate in advanced work, not only in all the laboratories, but in the clinical branches as well.

After all, it is not so much what a student is taught as what he learns for himself that counts.

This arangement does not in any sense preclude the adoption of honor courses; it rather furthers that idea. We would do well, I believe, to emulate the system in Europe, where the student follows courses when and where he pleases, does not belong to any special year, does not move forward with his class in lockstep progression, and where his two main objectives in

the undergraduate course are a primary and final clinical examination. Nor need this undergraduate teaching be under the aegis of any one university, if, perchance, the zealous student prefers the inspiration of an instructor elsewhere—physiology in one school, chemistry in another.

It does not always satisfy the brilliant man—starting in one institution, where favorable opportunities exist in anatomy, that he should be condemned to the exposure of poor teaching, say in physiology, when he might, under other auspices, sit at the feet of a master.

The Dearth of Great Teachers in America.—It should not be forgotten that the personality, the zeal and enthusiasm of great teachers add to the prestige of the school in far greater measure than does its administration, its curriculum or its equipment. For generations in Europe, it was the recognized celebrity in a school who attracted to its doors students and graduates in one sphere of study or another, men whose names shone like stars in the firmament, shedding lustre on the school, not alone because of their achievements, but because of the recognition their work received by an appreciative profession. Such were Virchow, of Berlin; Julius Cohnheim, of Breslau; Ludwig, of Leipzig; Johannes Müller, of Munich; Louis, of Paris; Murchison, of London, and Syme, of Edinburgh.

On this continent the magnet that draws men to great institutions is oftentimes its equipment, its facilities, location or reputation on grounds other than science or educational inspiration. Outstanding leaders in medical education may not be hard to find, but I doubt if, indeed, they receive that recognition which is customary in countries across the seas. Were it so, there would be greater migration of students from one school to another during their course—selecting inspiration here and knowledge there—as do so many of the better students of Europe. These facilities are difficult of attainment, too, in the block system of American education, which I make bold to say is a hindrance to our progress.

The State and the University.—The relation of the state to the universities, the medical schools and the medical profession has, I believe, a very direct bearing on the progress of medical education on this continent, and yet, notwithstanding its importance, I venture to say that nothing could be more confused, nothing could be more calculated to engender conflict between the universities and the state, and between professional aspirants and state boards.

Of the difficulties that lie in the way of progress in this field, perhaps none is more conspicuous than the absence of uniformity in the regulations governing state and medical school procedure. There can be no question as to the principle of state control, of governmental protection, on behalf of the community; the right on the part of the state to find out whether or not a candidate has the ability to practice his profession. But three separate interests are here concerned,—the state, the medical school and the profession as a whole—and all three are entitled to consideration in the adoption of our laws. These three bodies are in a sense partners, and as in any other partnership, so here, efficiency can only be attained through harmonious cooperation, through mutual respect for and recognition of each other's functions and privileges. In times of emergency, one or other of those bodies may usurp the power of another, but when the danger is past, progress surely demands a return to the normal organization, in which each member of the partnership takes up the functions assigned to it. To the state should belong the control in broad outlines of educational policy; to the colleges the right to determine its details; and to the medical profession, the insistence that these laws and policies are fulfilled.

The laws governing the training of the profession of medicine comprise two stages:

1. The preprofessional studies leading up to entrance into the Medical school.
2. The medical training proper leading to a license to practice.

There surely cannot be any doubt that if a medical school can be recognized by the state as a proper institution to undertake the responsibility of teaching medical students, it should be allowed to determine a candidate's qualifications to enter that school. Broad general principles as to these requirements may be laid down by the state, but surely a detailed specification as to subjects, hours and credits need not be given. Once this rule is established, the duty of the state becomes clear, viz., to insist on the fitness of the school to carry on its functions. It then remains for the school itself to determine the qualifications of its candidates to enter on the training and to follow the course.

The state should be content to examine the finished product. This official recognition of medical schools on the part of the state is, I think, extremely important. Its importance has been proved in England, and is, I believe, worthy of emulation. Where-

as the recognition should preferably be Federal, there seems little doubt that each state in itself may claim the privilege within its own domain. Individual states or provinces may differ in their opinions as to what these entrance requirements should be, and may decline to accept a candidate from the school of any other state or province on the basis of inadequate training. Such an arrangement, instead of being deterrent to progress, might be a stimulus to medical schools to attain a standard of excellence which cannot be disputed.

As to the second point at issue, that of medical training and licensure, opinions are not by any means unanimous as to detailed requirements of a medical curriculum for preparation to practice. With every year now some new complexity arises, some new contributions to our knowledge of the allied sciences as they affect medicine; new subjects are added to the student's list of studies and so the burden is increased.

Medical education is and must be everchanging if it is to be progressive. Legislation, on the other hand, is fixed and cannot be so easily changed. Despite this danger, state enactments are from time to time created, and laws are fixed—so binding on the prospective practitioner as often to bar his ambitions unduly. One state demands a knowledge of radiology; another a definite total of hours of instruction and so on, compelling the conscientious executive head of a state board to refuse many worthy candidates.

State control is a rational necessity, but it becomes a stumbling block to progress unless it is enlightened and fully appreciative of university standards and educational needs. The great achievements of these boards in recent years is significant of the desire for better standards, but the ideal is only to be attained through the closest co-operation of your association so representative of the profession with the universities and the state of provincial boards.

States may claim the right under such ideal auspices to determine the broad outlines of professional study, the minimum number of years of study (not hours or credits), the general range of subjects and their relative importance in the schools. Most of all, they should determine what schools merit official recognition as proper and fitting to confer medical education. Obviously, the state should decide on the nature of the final examination—the final test as to fitness for practice. This examination should be searching enough and should be governed by competent and approved examiners. If we may accept state

control in theory, we must expect the state to lead the way, using the examination as an instrument by which university standards may be raised—an examination, that is, of the finished product of a medical school recognized by the state. Such a test fulfils the requirements in the field of general practice, corresponding to the one portal of entrance to practice in Great Britain. In this country, however, there exist few, if any, paths leading to higher degrees, which would, as in England, imply a position of greater prestige in the profession. It might not be imprudent to mention the possibility of creating such a classification of practitioners for whom such a higher degree would mean much—a degree conferred by the teaching bodies in this country; and incidentally, the same might apply to the specialties, for which there seems to exist no recognized period of training and no diploma of competence.

It is significant, however, of the real advance on this continent that we already have two national boards of examiners—one in the United States and one in Canada. It is still more significant that the majority of states cooperate. In Canada, too, provinces unite in their recognition of the Dominion Medical Council. The Province of Quebec, it is true, demands as a preliminary qualification, its own provincial license for students of its own Province. This restriction, however, is a very natural and proper one; the majority of inhabitants in this Province are French-Canadians, whose system of education and whose traditions are in many ways different from the English. They are entitled to that respect which their traditions claim. While insisting on certain standards of preliminary education and certain professional standards different from those in other provinces, a cooperative scheme has been evolved which neither interferes with the English ideals nor with a harmonious understanding with the Dominion Medical Board. Some years ago, too, the Province of British Columbia abandoned its own examinations, making those of the Dominion Board the only portal to medical licensure in that province.

The Province of Alberta adopted a different and yet most satisfactory solution. While retaining a state or provincial board, it delegates the conduct of the examinations to the provincial university, accepting its certificates; while Quebec, in a somewhat similar way, delegates the same privileges or duties to the universities, but insists on the presence of an official assessor from their own Provincial Board.

What I should like to emphasize is this: The time was when the states had every inducement to dominate the medical school.

A very useful function was thereby performed, and the exercise of this state control during those years of development fulfilled a great and useful function for medical education. But as the medical profession and the universities, rising on stepping stones from their lower selves to higher things, provide for better education, one should beware lest state control be a menace to medical progress.

It is encouraging to note that most of the enlightened state boards on this continent have already taken cognizance of this need of cooperation, and I understand that we are rapidly getting nearer to the goal where the National Board of Examiners will be universally recognized, where the broad lines of medical education will be universally accepted, and where universities and state boards will work in harmony throughout the country.

Classification of Medical Schools.—As a result of the Carnegie Foundation report and the urgent needs of the country in matters of medical education, your Association has contributed the greatest possible service in standardizing up to a certain point the various schools in the country. This classification of medical schools has been, however, a matter of some controversy and criticism, and frankly, in our country, of some resentment—not alone on the part of those schools less favored, but of those educational authorities who believe that these standards are artificial and difficult of assessment.

To some extent, too, this classification is a menace to the independence and individuality of a school. The individuality of a good school is its proudest possession, and can often be preserved only by disregarding formulas to which a majority feel bound to subscribe lest they suffer in comparison.

Learning and education can scarcely be appraised by material things, and if a classification be based, as it must be to a large extent on material things,—finances, plant and equipment, it proclaims an educational attitude that is scarcely sound.

In some schools a reputation is based, and justly so, on some great teacher, one leader of a special department where others are deficient. In another, some outstanding investigation or successful research has placed the school in the forefront, although, perhaps, its graduates, as a whole, may be quite unprepared to measure up with the average of other schools. But while great teachers and distinguished investigators contribute in a large measure to a school's reputation, in the final analysis it is the product of the school which is the incontrovertible test from the point of view of any classification as understood in

this system. Furthermore, it is not alone what a student learns in his university but what is made of him in his career that counts.

We heartily endorse inspection of schools—an inspection which should be repeated and searching and inclusive, by competent men, and a final adjudgment of a school by a concensus of the competent.

A classification, if it must be so called, that on general principles, adjudges a school to be fitted to prepare students to practice medicine. Any further official assessment of the school is not for the good of education. A school is either fitted or not fitted to prepare doctors, and if the latter, is has no raison d'etre. Let the state decide this kind of classification, and let the state be guided by a representation of educational authorities guided by the universities and the medical profession as a whole.

We have already in this great land many organizations active in the cause of medical education. Among other, there is this most important American Medical Association, with its Council on Education and representing so completely the whole medical profession. There is an equally important Association of American Medical Colleges, sponsored by the universities, and equally eager to maintain the highest ideals of our profession. More recently, there has been formed the independent commission appointed through the cooperation of the universities and the Association of American Medical Colleges and aided by the Rockfeller and Carnegie Foundations and your Association—a Commission that is carefully and thoroughly seeking light amid the encircling gloom. This Commission, with its most excellent personnel, its meticulous weighing of evidence, will, I trust, do much toward establishing the duties of the state, the medical schools and the profession, respectively. Nevertheless, this diffusion of interest among many organizations cannot but be detrimental to the cause of progress. Surely it is desirable that we should abandon our local prejudices, our parochialism, and by merging our interests, unite in a general policy which will be more fruitful of results than any organization now existing. Cooperation is essential, and a merging of the state interests in a scientific cause is absolutely necessary for our development. There need be no sacrifice of privileges on the part of the individual states, and both universities and the profession can be gainers thereby. Given this fundamental and imperative need of enlightened and adequate cooperation, and forthwith our secondary school standards will be raised, our medical schools will attain their rightful place in the general scheme, and professional self-respect will be enhanced, as never before.

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SPECIALIZATION IN MEDICINE

In an article entitled "Present Tendencies in Medical Practice," Dr. H. G. Weiskotten* inquired into the type of practice followed by the graduates of two years—1915 and 1920. He sent 4,399 questionnaires to the graduates of fifty-two medical colleges and received 2,905 replies, or 66 per cent. Of the number, only 655, or 22.5 per cent, reported that they are in general practice, and 1,137, or 39.1 per cent, are limiting their work to a specialty. Of the remainder, 1,095, or 37.7 per cent, are in general practice but paying special attention to a certain field of practice.

There is a slight difference in the percentages of the two groups—the class of 1915 and the class of 1920. The number of physicians in general practice is virtually the same for both years, but only 36.1 per cent of the 1920 class are limiting their work to a specialty as against 39.1 per cent of the 1915 class; and 40.5 per cent of the 1920 class are paying special attention to a specialty as against 37.7 per cent of the 1915 class. Of course, it may be argued that the men in this group are really in general practice; therefore, the only figures to be considered are those of limitation of practice. And if the 33 per cent who did not answer the questionnaire had done so, is it not likely that they would be placed in the general practitioner class—which would reduce the percentage of so-called specialists very considerably.

Another item to be considered is the fact that some medical practitioners have left medicine entirely for a business career, but they still insist on being listed in professional directories, and often as specialists. Nearly every one has knowledge of such cases, and while the figures are not large, in fact, they are very small, they must be heeded when one is speaking in percentages. For instance, only 0.6 per cent and 0.5 per cent, respectively, for the classes 1915 and 1920, stated that they are not in practice.

Rather startling figures are those given by Weiskotten with respect to the number of men who will eventually limit their practice to a specialty if they carry out their present plans. No less than 67.8 per cent of the 1915 class and 74.1 per cent of the 1920 class expect to be specialists! Does this mean that we are faced by the prospect of a time coming when there will not be any general practitioners? In answering this question one must be mindful of the fact that teaching of the specialties has decreased steadily since 1920; that more and more stress is being laid

*Bull. Assoc. Am. Med. Coll. 2:29 (Jan.) 1927.

on the necessity of considering general practice as a chosen field of practice, at least for a considerable period after graduation, and that the actual figures bearing on special practice, as stated above, do show a falling off for the 1920 class as against the 1915 class.

Certain data bearing on this question may be taken from the physicians' directory published by the American Medical Association.* The figures are astonishingly like those given by Weiskotten. Approximately 158,000 names are listed in the directory. Of this number 93,000 (in round numbers) are members of the American Medical Association; that is, they hold membership in a component unit. This membership represents 58.23 per cent of the total number of names listed in the directory, and of these, 38.53 per cent (36,000) of physicians assert they are in special practice. Weiskotten's figures are 39.1 per cent and 36.1 per cent for 1915 and 1920, respectively. The point to be borne in mind is that in spite of the fact that Weiskotten did not get full returns, his figures for computation equal those on which the directory percentages are computed; so that a complete return or count probably would not alter the figures so much that their reliability would not be open to question. The directory figures are available to any one who wishes them. Lists of specialists have been compiled for each group and may be had for a stipulated consideration.

At any rate, the whole question of specialism is not yet solved. Whether it ever will be is doubtful. So far as the medical schools are concerned, they must be mindful of the fact that it is their function to produce a medical practitioner, one who can minister to the whole public in time of illness. Graduate and postgraduate schools produce specialists and—a fact that is often overlooked—better practitioners. There will always be a place and a demand for the general practitioner, and it rests entirely with that group as to whether or not they are faced by elimination. Any group that gives the best medical service possible does not need to fear elimination.

* American Medical Directory, Ninth Edition, 1925.

REPORTING ON PROSPECTIVE MATRICULANTS

Dr. B. D. Myers, who is making the study of prospective candidates for admission to medical schools, has worked out a new card which will define "matriculation" more definitely than did the card he used heretofore. His reasons therefore and a copy of the card are given herewith.

"On further consideration and correspondence I am led to propose the enclosed for the card for medical schools for the coming year for the following reasons:

1. "It will obviate the necessity for a definition of the term application, which however clear would surely be lost in some offices and its terms unobserved. Those who fill out the cards will have constantly before them all they need to know.

2. "Last year our cards emphasized 'acceptance' and 'refusal,' and did not yield the information we had hoped, whether prepared men failed to secure matriculation in some good school. It seems obvious cards should emphasize primarily that credentials are satisfactory or unsatisfactory and secondarily details of acceptance or refusal.

3. "I believe the card will give the information we wish and be as nearly misinterpretation proof as it possible.

4. "Number 2 gives point to reports of schools having requirements in excess of the minimum laid down by this Association."

APPLICANTS FOR FRESHMAN MEDICAL MATRICULATION
1927-1928

School of Medicine_____
(name)

Name of Applicant_____

Address of Applicant_____

I. Credentials satisfactory (quantitatively)
   1. Accepted, matriculating for first time
   2. Accepted, repeating freshman year
   3. Refused because class full
   4. Refused because of personality or poor scholarship.

II. Credentials examined and found inadequate (quantitatively)
   1. To meet requirements of THIS school
   2. To meet minimum requirements of A.A.M.C.

III. Credentials not seen or examined. Unofficial statements indicate
   1. Probably satisfactory (quantitatively) to meet minimum requirements of A.A.M.C.
   2. Probably NOT satisfactory to meet minimum requirements of A.A.M.C.

Note—The above makes no provision for record of inquiries, requests for catalog, blanks, etc., from merely prospective applicants.

This study provoked a great deal of discussion of an extremely favorable nature among medical school executives; hence it is very desirable that the information given be as exact as possible. Dr. Myers has a sufficient supply of cards for the needs of all the schools and will respond promptly to requests for additional cards. His task is a very arduous one and he will appreciate greatly ready compliance with his request for early and complete replies. Address: Dr. B. D. Myers, Indiana University, Bloomington, Indiana.

SALVAGE

A noteworthy innovation in teaching was met with on a recent visit to the Rochester division (Mayo Foundation) of the medical department of the Graduate School of the University of Minnesota. Those in charge of the work called it "salvage." The term is not inappropriate because the work is concerned primarily with salvaging or making fit for surgical intervention patients who on their arrival at the hospital are classed as "inoperable." The therapeutic measures employed are wholly the so-called medical agents. The results of the work are astonishingly good. Many patients are made ready for operation, or if not, their lives are prolonged and the joy of living is restored; at least, life is made more comfortable.

This work is mentioned here solely

for the purpose of bringing it to the attention of undergraduate schools who will do well to consider introducing a similar course into their schedule, taking the time for it from the time ordinarily devoted to surgery. Then, too, it brings up the question whether surgery, as such, should not be considered as a form of treatment rather than a specialty in medicine. The etiology and symptomatology of gastric ulcer, for instance, is the same no matter what form of treatment is adopted, whether it be medical or surgical. There is no such entity as a "medical" ulcer or a "surgical" ulcer. Those terms have reference only to the form of treatment employed. Even a fracture cannot be considered a "surgical" disease; nor is its treatment always surgical, unless one must regard the replacement of fragments by manipulation, the application of splints or casts as surgical procedures. Is the replacement of a dislocation surgery? Of course, the derivation of the word "surgeon" (chirurgeon) indicates that he is one who uses his hands; but the term "chiropractor" is of similar origin, and, surely no one would consider him to be a surgeon. For the best treatment of fractures a good knowledge of blood chemistry—especially so far as calcium is concerned, is of inestimable value. And that is not surgery.

Would it not simplify matters if instead of making three groups in the clinical curriculum: (1) medicine and medical specialties; (2) surgery and surgical specialties and (3) obstetrics and gynecology,only two groups were made: (1) clinical medicine and (2) obstetrics, leaving for special study and future development the acquisition of special training that is needful for the proper practice of surgery and any and all the so-called specialties in medicine and surgery? what a great help that would be to medical school authorities and to the student who during his residence in college would never be diverted from the end in view—to make him a good practitioner of medicine, one who has been trained to recognize when surgery or any other special form of treatment is indicated, for which he may not possess the necessary skill, but which may be acquired by further study. It is something worth thinking about.

RELIGIOUS FANATICISM THREATENS MEDICAL EDUCATION

Medical education is in danger of being handicapped by the present opposition to evolution on the part of well-meaning, but unintelligent people. Imperfect preparation of their students is one of the most serious difficulties which professional schools face. Not merely do students lack scientific training in college, but too often scientific training in high school. This difficulty will be seriously increased in states because of the anti-evolution hysteria. In some states it is already a punishable offense to teach evolution in tax-supported schools. In consequence, textbooks will affect still other areas than those in which religious obscurantism is politically triumphant. Already certain books of real scientific quality are being withdrawn from circulation in several states, and still others are being revised so as to omit not only reference to evolution, but even scientific data upon which the evolution theory is based. As it is

unlikely that publishers can afford to get out special editions for such states as have passed the anti-evolution bills or are at the mercy of text-book commissions, the tax-supported colleges and medical schools throughout the United States will be forced to use text-books that have been censored by the ignorant. This already has occurred in at least one text-book on biology and will undoubtedly happen in other cases, unless authors and publishers are ready, as to their credit some are, to sacrifice sales in the interest of intellectual probity.

The extent of the effort on the part of religious reactionaries to bring about anti-evolution legislation would surprise those who have not been in touch with the matter. During the present year bills have been introduced in many states, among them Arkansas, Missouri, Minnesota, Maine and New Hampshire. Leaders of the fundamentalist's are threatening to propose such bills in every state in the Union. Already several states have adopted such legislation. Fortunately others have rejected them. The matter has long since passed the laughing stage. The crusade is being carried on in many pulpits. Not only is freedom of thought threatened, and religious intolerance liable to be fastened on American education, but fundamental scientific positions are being assailed in the name of loyalty to the Bible. If these present attacks on biology and physiology are successful, we may logically expect that legislation in the interests of protecting what its proponents regard as inspired biblical teaching will be directed against astronomy, physics and botany. A teacher in a tax supported school may yet be punished for teaching that day and night are due to the relation of the earth to the sun; that the sun and the stars came into existence before plants were on the earth; that animals and birds were in existence before man; that woman was not made from a rib of the first man after animals had been named by him.

A prospective physician, during the course of his education, is thus in danger of being brought into subjection to willful hostility to science based upon an unintelligent use of the Bible. The bearing of such a situation upon future physicians and surgeons is too threatening to justify indifference on the part of those who really believe in science or religion, much less on the part of those who believe in both.

SHAILER MATTHEWS,
Dean, Divinity School,
University of Chicago.

College News

Northwestern University Medical School.—Accompanying this item is shown a picture of the new home of the Schools of Medicine and Dentistry of Northwestern University. This building is one of a group situated on McKinlock Campus in the city of Chicago, on the lake front, in what is sometimes referred to as Streeterville in remembrance of the militant sea captain who claimed the property on the basis of squatter's rights. The medical school occupies the first, fourth, fifth, sixth, seventh and fourteenth floors of the building.

LIBRARY.—The Archibald Church Library is situated on the first floor. The reading room will accommodate

Schools of Medicine and Dentistry, Northwestern University, McKinlock Campus, Chicago.

170 students, and the six seminar rooms will take care of 24 students. The stack room is equipped to take care of 30,000 volumes.

DISPENSARY.—The outpatient department, on the first floor, comprises fourteen departments, including a department of physiotherapy. A separate elevator convoys the patients from this department to the three clinic floors.

CHEMISTRY.—The laboratory of biochemistry is located on the fourth floor. On the same floor is a graduate laboratory which will accommodate 24 students. Special cubicals for animal work immediately adjoin.

DEAN'S OFFICE.—On the same floor are located the offices of the dean and the registrar.

PHYSIOLOGY AND PHARMACOLOGY.—These two departments are located on the fifth floor. Separate rooms are provided for each group of eight students and complete equipment for mammalian experimental work is provided. There is also a small general laboratory for nerve-muscle work and special research rooms for physiological work.

PATHOLOGY AND BACTERIOLOGY.—These two departments occupy the sixth floor. Here, too, the cubical plan prevails. The preparation room for bacteriology is a model of ingenious design and convenience. The Frederick Robert Zeit Pathological Museum is on this floor, and adequate preparation rooms and rooms for the museum curator adjoin this museum.

ANATOMY. — The department of anatomy occupies the seventh floor. Separate dissecting cubicals accommodate groups of eight students. These cubicals have slate slab partitions which also serve as blackboards. One large room adjacent to the smaller rooms provides space for the study of moist sections, models, etc. The museum of anatomy is on the same floor. Pictures of famous anatomists line the walls.

Adjacent to the anatomical museum is the general laboratory of microscopic anatomy. Each table receives direct lighting from a skylight so that desk illumination is not required. Space is also provided for research rooms.

The Medical School announces the appointment of Dr. Lewis J. Pollock as head of the department of neurology and psychiatry. Dr. Pollock, Dr. Chas. Elliott and Dr. Allen B. Kanavel, all of this faculty, have been invited by the Melbourne Permanent Committee for Post Graduate Work to deliver a series of six lectures in the fall of 1927. Dr. Elliott will lecture on thyroid diseases, diabetes and the clinical aspect of kidney function. Dr. Kanavel will lecture on general and brain surgery.

The Archibald Church Medical Library has been made the beneficiary of a fund of $25,000 the income from which is to be devoted to the purchase of books and the maintenance of the library.

Stanford University School of Medicine. — The following action was taken recently by the Medical Faculty of Stanford University:

It was decided that in the Medical School at San Francisco departmental examinations be substituted for individual course examinations. Each department head is to be required to make arrangements for the keeping of records of the attendance of students at the individual courses in his department and of such records of the progress of students in the individual courses as may seem desirable. These records shall be kept on file in

the office of each department head and from them reports on the attendance of the students in the individual courses shall be made to the Dean's office whenever desired. If a student wishes to transfer to another medical school, he shall be entitled to an examination in any required course completed that has not been covered by a departmental examination. The character and scope of the departmental examinations shall be determined by the departmental faculties. In arriving at the final grade in departmental examinations, the character of the work of the student in individual courses may be taken into account.

Under the new rule of the faculty, formal examinations shall be held as follows:

At the end of the second year: Medicine, introductory; surgery, introductory; obstetrics and gynecology, introductory.

At the end of the eighth quarter: Public health and preventive medicine; pharmacology.

At the end of the third year: Pathology; internal medicine; surgery; gynecology.

At the end of the fourth year: Medicine and medical specialties, including pediatrics, neuropsychiatry; dermatology, radiology, physiotherapy. Surgery and surgical specialties, including orthopedic surgery, genito-urinary surgery, oto-rhino laryngology, ophthalmology.

The examinations at the end of the fourth year should be of a very general nature and should cover all aspects of a given problem presented.

Nothing in these regulations shall be construed as preventing any instructor to give such tests in regard to the progress of the students in his courses as he may think necessary. These tests, however, must be arranged for during regular hours of the course.

George Washington University Medical School.—The affiliation between this medical school, Garfield Hospital and the Cancer Hospital, which latter is to be erected as soon as plans can be made, was completed Jan. 21, 1927.

In the affiliation, while certain subsidiary agreements were made, the following Articles were of basic importance:

ARTICLE I.—Each party hereto will continue its independent corporate existence and control, with the distinct understanding, however, that in making and carrying out this affiliation, the general conduct of the hospitals and medical schools and the medical teaching therein must be such as will comply with the requirements of the Council on Medical Education and Hospitals of the American Medical Association and the American College of Surgeons; and in order to accomplish this

(*a*) The University through its medical school shall have exclusive and complete rights in the said hospitals as far as all teaching is concerned, ...

ARTICLE III. . . . .

(*e*) The Board of Trustees of the University is to make appointments to its Medical Faculty, in accordance with the provisions of its Charter.

ARTICLE XV. It being considered desirable that each of the contracting parties shall have at least two representatives on the Board of Directors or Trustees of each of the others, it is agreed that as a vacancy occurs on either of said Boards, nominations to fill such vacancy shall be invited from the other contracting parties hereto, and from the nominations so made the vacancy shall be filled, unless in the judgment of the Board upon which the vacancy occurs such election would be detrimental to its best interests, in which event further nominations shall be invited and one of said nominees elected as aforesaid.

Thereafter and as further vacancies occur they shall be filled in a similar manner, so that thereafter there shall be at all times on each Board at least two persons nominated by each of the other Boards.

The matter of affiliation with the Episcopal Eye, Ear and Throat Hospital, including the sale of its present property and removal to the new Center, is now actively under consideration. It is hoped that one or more other hospitals in the city will adopt the same course.

University of Michigan. — The Thomas Henry Simpson Memorial Institute for Medical Research at Ann Arbor was dedicated Feb. 10, and Drs. Cyrus C. Sturgis and Raphael Isaacs, former members, department of internal medicine of Harvard Medical School, were installed as director and assistant director, respectively. The principal address at the dedication was given by Dr. Henry A. Christian, professor of medicine at Harvard. The institute is a memorial to the late Thomas Henry Simpson of Detroit, whose widow gave to the University of Michigan more than $450,000, half of which was used to construct and equip the building, and the remainder set aside, so that the interest can be used for salaries of the staff. Research will be directed primarily toward the investigation of pernicious anemia.

The Medical School has also received a gift of $50,000 to be used for the purchase of medical incunabula that are to be placed in the medical library.

Indiana University School of Medicine.—This school holds a monthly seminar at which interesting or unusual cases occurring in the university hospital are presented and discussed, or research work of the university relating to medical subjects is explained before the students and faculty of the school. Physicians who are not connected with the school may attend if they wish to do so.

Dr. Charles P. Emerson, dean of the school, was re-elected president of the national committee for mental hygiene at the annual meeting held in November.

Summer courses for practicing physicians are now being worked out. Courses in clinical medicine, laboratory methods and surgery will be offered.

University of Tennessee Medical School.—The new anatomy building situated on the medical campus in Memphis was dedicated in December. This is the first of a group of buildings in a comprehensive plan of development including housing facilities for the schools of medicine, dentistry and pharmacy. The anatomy building for the present will also house the departments of anatomy, physiology and pharmacology and biochemistry. The department of pathology and bacteriology is housed in the Pathologic Institute building situated on the grounds of the Memphis General Hospital just across the street from the medical group.

Dr. M. B. Vischer, recently of the faculty of the medical school of the University of Minnesota, has accepted the appointment of associate professor of physiology and has entered on his new duties.

In December, 1926, the trustees of the University of Tennessee and the municipal authorities of the city of Memphis declared null and void a then existing contract between the university and the city with

reference to the professional services to be rendered by the university to the Memphis General Hospital, and immediately entered in a new contract which continues the already existing working arrangement between the two institutions for a term of fifty years. The city agrees to maintain the hospital and the uinversity, through its medical school, provides medical and nursing care and has full teaching privileges. This hospital is situated across the street from the medical school. It has a capacity of about 350 beds, with a separate pavilion for maternity work and a pathological institute, built by the college, in which are also housed the laboratory of the city health department. All of these facilities are made use of by the college in its teaching work.

Western Reserve University.—The General Education Board has given the university a grant of $975,000 of which $750,000 is to be used to build an institution of pathology for the school of medicine and its affiliated hospitals. Construction work will be begun shortly. The plans call for a four story building, 157 feet long and 55 feet wide. The new institution will be under the directorship of the medical school and will combine the work of the department of pathology of the school with the pathology of the affiliated hospitals. Dr. Howard T. Karsner, professor of pathology and head of the department, will head the institute.

The General Education Board has also given the university $75,000 a year for three years for the entire budget of the medical school.

Dr. Emerson Megrail, assistant professor of hygiene and bacteriology, has been granted seven months leave of absence to work at the Lister Institute, London, under the direction of Sir John Ledingham.

Columbia University College of Physicians and Surgeons.—Dr. George S. Huntington, for many years professor of anatomy, and whose work is known far and wide, died January 5 at the age of 75.

University of Nebraska. — Mr. Samuel Avery, formerly professor of chemistry and for nearly twenty years chancellor of the university, has resigned because of ill health.

Harvard Medical School. — Dr. Walter B. Cannon, George Higginson professor of physiology, is the acting dean of Harvard University Medical School during the absence of Dr. David L. Edsall in China. Dr. Edsall was granted a six months' leave to enable him to accept an invitation to be visiting professor of medicine at Peking Union Medical College.

Dr. William C. Quimby has been promoted to clinical professor of genito-urinary surgery and Dr. Karl M. Bowen to assistant professor of psychiatry. Dr. Cecil K. Drinker, professor of applied physiology and assistant dean of the School of Public Health and Hygiene, has gone to Copenhagen to work with Dr. Krogh.

Boston University School of Medicine.—Dr. Charles T. Branch, assistant professor of pathology, Dr. Clara Loitman, instructor in pediatrics; Dr. Charles Sziklas, instructor in physical diagnosis and assistant in anatomy; Drs. John J. Elliott, Jr., Bernard Lederman and Sigmund Simons, assistants in obstetrics; Dr. Julius Gottlieb, assistant in pathology; Dr. Mina Claire Sprague, assistant in gastro-enterology; Drs. Edward

L. Perry and Harry Schwartzmann, assistants in ophthalmology, and Drs. Earle F. Frior and Maurice L. Silverstein, assistants in pediatrics. The following promotions have been reported: Drs. David L. Belding, William A. Ham, William D. Rowland, Edwin P. Ruggles, William H. Watters and J. LeRoy Conel, Ph.D., to full professorships; Drs. Edwin W. Smith and Myrtelle M. Canavan to associate professorships; Drs. John A. Foley, Winfred Overholser, William D. Reid and Clarence Wesley Sewall to assistant professorships; Drs. William H. Clewley and Harry Emmons to instructorships, and Dr. George H. Earl, lecturer, Dr. Albert W. Horr becomes emeritus professor of ophthalmology, and Dr. N. Emmons Paine, emeritus professor of psychiatry.

Medical College of State of South Carolina.—The faculty of this college announces the privilege of borrowing periodicals and other publications on file in the college library is now extended to all legally qualified members of the medical profession of the state, subject to certain restrictions. The physician must pay postage both ways. Material will be loaned as a rule for not more than ten days and security must be given to the value of the material loaned.

University of Virginia Medical Department.—Dr. Alfred Chanutin, assistant professor of biochemistry, has been granted a leave of absence for research work with Professor Ross at the University of Illinois.

McGill University Faculty of Medicine.—Dr. Charles L. O'Conner, instructor of pathology at the Harvard Medical School, has accepted a temporary appointment as associate professor of pathology.

The Rockefeller Foundation has contributed $500,000 to the new university mental clinic of which Dr. Meakins has charge.

Detroit College of Medicine and Surgery.—It is proposed to create a fund for a school of research and subscriptions amounting to $60,000 have already been received. Dr. Angus McLean donated $10,000 in memory of Base Hospital No. 17 with which he served in France during the World War.

Duke University.—Dr. Wilburt C. Davison, associate professor of pediatrics and assistant dean of Johns Hopkins University Medical School, has been elected dean of the new medical school to be organized by Duke University, Durham, N. C. Dr. Davison will not leave Baltimore until September. It is announced that he will at once assume responsibility of the organization of the school and the construction of the hospital and medical buildings.

University of Chicago.—Dr. James B. Herrick retired as clinical professor and chairman of the department of medicine in Rush Medical College and was appointed professor emeritus. Dr. Herman N. Bundesen, health commissioner of Chicago, was appointed professorial lecturer on public health for one year. Dr. Franklin C. McLean was appointed vice-chairman of the faculty of the Graduate School of Medicine and of the Ogden Graduate School of Science in which the medical courses are now placed. Dr. Chester S. Keefer has

been appointed resident physician in the medical clinic of the Billings Memorial Hospital and instructor in medicine.

It is reported that in recognition of his long and distinguished services as a teacher and in medical research, the clinic of internal medicine in the new medical school has been named in honor of Dr. Frank Billings. This clinic will occupy the northwest section of the new medical quadrangle on the Midway. The hospital unit of the medical school has already been named in honor of Dr. Billings' uncle, Albert Merrit Billings.

The following faculty appointments have been made: Dr. Francis A. Lane, clinical professor and vice-chairman of the department of ophthalmology in Rush Medical College from Oct. 1, 1926 to June 30, 1927; Dr. Friedrich Hiller of the University of Munich, associate professor of medicine, for a term of three years, on a four-quarter basis; Dr. Max P. Gethner, clinical associate in the department of medicine in Rush Medical College for one year from July 1, 1926; Powis L. Heitmeyer, research fellow in the department of pediatrics in Rush Medical College, for the autumn quarter, 1926. Dr. Joseph A. Capps and Dr. Joseph L. Miller have been transferred from clinical professorships in the department of medicine, Rush Medical College, to clinical professorships in the department of medicine, Ogden Graduate School of Science for three years from July 1, 1927.

Albany Medical College. — Mrs. Grace Merrill Lown has given the college $100,000 with which to endow the Merrill professorship of pathology in memory of her father, Dr. Cyrus Strong Merrill, late professor of the diseases of the eye and ear in the college. An agreement was made in the deed whereby the professor of pathology in the medical school shall be the director of the pathological laboratory in the Albany Hospital with which the school is closely affiliated.

Woman's Medical College of Pennsylvania.—Plans are under way to campaign for $1,500,000 to be used in the construction of a new college building and hospital to be erected at the Falls of Schuylkill. The college building is planned to house 200 students and the hospital 250 beds. About 1,600 women have been graduated from this school during the last seventy-six years.

University of Manitoba Faculty of Medicine.—Dr. Daniel S. MacKay has been appointed head of the department of gynecology to succeed Dr. Robert M. Simpson, who retired. Dr. Tudor J. Jones, of Glasgow, has been appointed assistant professor of anatomy.

University of Minnesota Medical School.—Dr. George B. Eitel has given the University $80,000 "for the development of loan scholarships for the benefit of medical students." There is now available for loan purposes annually $5,000, which sum includes loans returned by student borrowers.

National Board of Medical Examiners.—During 1926, 243 physicians were awarded the certificate of the Board. The medical schools from which these diplomates graduated were: Harvard, 52; Rush, 30; Johns Hopkins, 24; Pennsylvania, 24; Cornell, 12; Virginia, 9; Yale, 7; Oregon

and Tufts, 6 each; Buffalo, Columbia and Northwestern, 5 each; Medical Evangelists, Michigan and Vanderbilt, 4 each; California, Illinois, Iowa, Minnesota, New York, Syracuse, Vermont and Washington, 3 each; Albany, Boston, Creighton, Manitoba, Pittsburgh and Toronto, 2 each; Beirut, Budapest, Colorado, Hunan-Yale, Jefferson, Moscow, Tennessee, Texas, Tulane and Woman's, 1 each.

Of sixteen candidates examined by the Subsidiary Board of Baltimore in October, 14 were successful. Ten of these diplomates are graduates of Johns Hopkins University Medical School.

University of Pennsylvania.—Mr. and Mrs. Henry Phipps, New York, have offered $500,000 to the university to enlarge the Henry Phipps Institute, provided the university raises an equal sum. It is also planned to establish a foundation with an endowment of $500,000 as an adjunct to the school of surgery, to construct the Martin Maloney Clinic at a cost of $750,000 for which Mr. Maloney has offered $250,000, and to establish the Joseph Leidy chair of anatomy with an endowment of $200,000. The Rockefeller Foundation and the General Education Board each offered $250,000 toward the institute of anatomy, and alumni and friends have subscribed equal amounts.

Prize Essay on Medical Education.—The *Deutsche medizinische Wochenschrift* has offered a number of prizes for the best suggestion on medical study, especially for the production of the general practitioner group. The first prize is 1,000 mark (approximately $225,000); the second prize is 300 mark; the third, 200 mark and the fourth and fifth prizes consist of books, to be selected by the winners, in value up to 150 and 100 marks, respectively. The judges are Professor Dippe, B. Fischer, Hansberg, Schieck, Streffer, Vollmann and the editor of the D. m. W. Only practitioners of medicine and seniors in course may enter the contest.

Laval University Faculty of Medicine.—The increase in the number of students has continued for the past five years. For the present school year there are registered 223 students: 47 first year; 56 second year; 33 third year; 50 fourth year and 35 fifth year. This school is located in Quebec.

Brown University Medical School.—At a recent meeting of a county medical society, the president of the society suggested that Brown establish at least a graduate school of medicine; that one chair at a time be established and that the first one be named in honor of W. W. Keen, of Philadelphia. Dr. Keen has served Brown in an official capacity for many years. An undergraduate medical school was organized at Brown in 1811 and became extinct in 1827.

University of Portland Medical School.—A resident of Portland has donated $3,000 to the medical school for the purchase of an electrocardiograph.

Johns Hopkins University Medical School.—The new quarters of the gynecologic department were formally opened January 24 on the sixth floor of the Woman's Clinic. There are five distinct units in which operations can be done simultaneously in the presence of students. The cost of the new quarters was $150,000.

Tulane University School of Medicine.—It is reported that Dr. Rudolph Matas has resigned his teaching work in the school and that Dr. Edward W. A. Ochsner, associate professor of surgery in the Medical School of the University of Wisconsin, has been appointed head of the department of surgery to succeed Dr. Matas.

University of Cincinnati College of Medicine.—A series of lectures on popular medical subjects is announced. They will be open to the citizens of Cincinnati and vicinity. The object is to acquaint the public with methods of modern medecine.

University of Oregon School of Medicine.—The regents of the university and the commissioners of Multnomah County have entered into an agreement whereby a closer affiliation is established between the medical school and the county hospital.

Dr. Noble Wiley Jones has given the school $5,000 as an endowment for a visiting lectureship.

Abstracts From Current Literature

MEDICAL EDUCATION AND ITS PRODUCT

The fault in medical education of today lies not so much in the present premedical requirements or in the medical curriculum as in the lack of the instillation into the medical students and graduates of the proper conception of what constitutes the true practice of medicine. Much of the difficulty lies in the fact that the undergraduate medical college has too many departments, each operating as a distinct and separate unit. Would it not be well for the undergraduate medical school to have only six departments, three in the so-called fundamental branches and three in the clinical branches, namely: (1) A department of anatomy to include histology, embryology, applied and neuro-anatomy; (2) department of pathology, bacteriology, hygiene and preventive medicine; (3) department of pharmacology, physiology and biochemistry; (4) department of medicine to include all medical specialties; (5) department of surgery to include all surgical specialties; (6) department of obstetrics and gynecology. Each department head should be a graduate of medicine and, if possible, for the fundamental department's one with clinical experience. This would permit (1) elimination of excessive duplication; (2) better correlation; (3) elimination of the teaching of too much theory with possible reduction in the number of hours for some courses; (4) it would place the specialties in proper relation to the major subjects and still permit sufficient teaching for the general practitioner; (5) it would decrease administrative problems. Too much of our clinical teaching is done in hospitals. The tendency at least is for the graduate to become an hospital habitue. Eighty to 90 per cent of patients can be cared for in the office or in the home. We must utilize to a greater extent and in a better way the dispensary for teaching the students the care of that type of patient which later will make up the greater part of his office practice. In addition to the hospital training, I would advocate the adoption of some modification of the preceptor system. Could not the senior student be placed

with some good practitioner and make both office and home visits with him for a certain length of time? We should recommend to our students that they spend their summers with general practitioners. At the same time we will have to encourage the better practitioners to take on this additional responsibility. The student could commence this during the summer following the first year in medicine. Medical education must devise ways and means of emphasizing the value to the graduate of a thorough knowledge of preventive medicine in its fullest application. The present method of teaching of this subject in many of our medical schools is a sad commentary on medical education. The ideal teaching of this subject will be reached when every instructor in the medical school considers it a part of his duty to teach prevention.—W. H. Morsund, *Southern M. J.* 19.896. (Dec.) 1926.

TEACHING SERVICE LOWERS MATERNAL AND INFANT MORTALITY

Since 1922, the John E. Berwind Maternity Clinic — an organization that had been giving maternity care for the past twenty years—has been a teaching service for the Cornell University Medical School and it is here that the fourth year students have obtained their practical work. This clinic is housed in a suitable building with quarters for the students and has a resident staff of four men. There are twelve nurses, including those in the maternity and infant divisions. The total number of visits for four years—antenatal, natal and postnatal—is 74,207; 19,294 were made by doctors and students, 41,125 by nurses and 13,788 antenatal and postnatal visits were made by the patients to the clinic. In addition to the antenatal and delivery care, there is a follow-up clinic and cases requiring operative repair are transferred to another teaching hospital. At the end of two weeks the babies are transferred to the Pediatric Department of the clinic where they are cared for throughout one year. The outdoor department of the clinic stands in relationship to a hospital that is ready to receive at all times the abnormal and emergency cases that arise in the course of the service. All major abnormalities are transferred, if possible before interference or even before labor. Students, under the direction of the resident, are permitted to make vaginal examinations, but unnecessary and repeated examinations are discouraged. Rectal examinations are not made. At the end of two weeks, the student usually has fourteen deliveries to his credit. In at least one-half of these he has delivered the patient himself and in the remainder has acted as assistant. In addition to his delivery work he has attended the prenatal clinics and made postpartum calls on the patients that he has delivered. The operative work in the outdoor cases consists almost entirely of forceps deliveries, versions and procedures for the control of hemorrhage and is conducted by the resident in the presence of a member of the visiting staff. Cases for cesarean section and antenatal bleeding cases are transferred to a hospital. Bailey asserts that with close control and adequate facilities a teaching service can be conducted with considerably lower death rate than that generally prevalent in the community. —Harold Bailey, *Am. J. Obst & Gyn.* 12:817 (Dec.) 1926.

PATHOLOGY AND MEDICINE

Pathology collects facts, and organizes and correlates them in the manner of science. It takes its place in general biology in the consideration of disease in man, lower animals and plants, and thus enjoys a far-flung activity. Its methods of observation are those of the biologist, the anatomist, the histologist, the physiologist and the biochemist. The postmortem examination is the dissection method of the anatomist, modified in so far as the exigencies of circumstances demand. The preparation of tissues for microscopic examination is that devised by the histologist and modified to suit differing circumstances, especially the need of the clinician for an early report. The methods of physiology, biochemistry, bacteriology and immunology are taken over without change. The pathologist, therefore, can lay claim to no method which is strictly and solely his own. Pathology regarded as applied science becomes more closely interwoven with the clinic as training is extended and mutual co-operation is developed. Sympathy and harmony between the clinician and the pathologist are essential to the progress of medicine. The pathologist must seek his work among the living as well as the dead. He must recognize the applied science depends on broadening the field of pure science and therefore continuously look to the physicist, the chemist, the biologist, the anatomist and the physiologist for the enriching information which they alone can supply. It behooves the teacher of pathology to know the broad principles of the subject and the teachers of the clinical subject to know the application of these principles in the special fields. Pathology, then, is not a subject for any particular year, but is to be found throughout the entire medical course. The aim of the teacher should be to direct and aid the student in learning, and for this purpose he should place at the disposal of the student materials suitably prepared, books and a point of view. In each subject there is a cultural value in training a student to think logically. There is also a content value, essential to his technical education. The cultural value depends entirely on the point of view of the instructional staff and the receptivity of the students, and may be as well developed in a course of fifty hours as in one of a thousand hours. The content value is that element which must be adjusted to the time available. In this adjustment, the objective of the whole medical course must be considered. It seems reasonable to state, therefore, that each subject, preclinical or clinical, must be conducted with the sole idea as to how it may best suit the purpose of the school in training the students for the practice of medicine. A course in pathology can be so conducted that a moderate amount of work in pathologic physiology can be included. This physiologic work may be planned as an extensive series of demonstrations prepared by the instructional staff, or may be participated in by the students. As part of the objective method of teaching, participation is to be preferred to demonstration. A selection must be made of the topics to be covered. By rotation all the members of smaller classes and most of the members of larger classes can engage in the work. In the field of general pathology a small group of students may perform experiments, and report and demonstrate to their colleagues. In the study of heart dis-

ease, five students are called to the small room equipped with physiologic apparatus. A chief operator is selected, and assigns his fellows to such special task as anaesthesia, insertion of necessary cannulas, manipulation of the kymograph and recorders. The first experiment, hydropericardium, is explained, and the students proceed with the work under close supervision. The chief operator makes the necessary notes, preserves the tracing, and studies it for subsequent presentation to the entire class. On the next day five other students conduct an experiment on aortic stenosis. Five more take up aortic regurgitation, five take experimental myocardial degeneration, and five study air embolism. The quantitative study of fat embolism in the rabbit, with autopsy and frozen sections of the viscera, is participated in by only two students. Thus, twenty-seven students are engaged in this work, each of whom loses not more than three hours from the study of the pathologic morphology of this system, which is going on contemporaneously and with proper emphasis as to its importance. At the time aortic stenosis is produced, students are called from the neighboring class-room in groups of eleven. With the multiple stethoscope they hear the normal heart sounds, and then as the noosed ligature is tightened around the aorta, hear the murmur. In this manner, the first murmur a student is privileged to hear requires no stretch of the imagination as to its character, time and audibility. On the last day of the time allotted to the cardiovascular system, the students assemble in the amphitheater of the City Hospital for a three hour period, with short intermissions at the end of each hour. In the first hour, six or eight preserved human hearts are handed each to two students. All the members of the class have previously learned the method of opening a heart by individual practice on calves' hearts, bought especially for the purpose. During the periods devoted to gross morbid anatomy they have had experience in describing organs and reaching conclusions as to the lesions present. At this exercise they demonstrate and diagnose the lesions present, under the constant criticism of their fellows. The next hour is occupied by the chief operators in charge of experiments, who demonstrate their tracings. Each tracing is scrutinized by the class, and the chief operator is then "cross-examined" by those on the benches. In the interval before the third hour, two or three patients are taken into the amphitheater. A professor gives the history, explains the nature of the case, states the results of physical and other examinations, and demonstrates the murmurs by means of the multiple stethoscope. The students are then allowed to feel thrills, and listen to murmurs with their own stethoscopes. Renal lesions are studied in like manner. The relations of the pathology of function to the practice of medicine are many. Today almost every hospital of high range has a large part of its scientific spirit centered about the clinical-pathologic conference. The purpose of the conference is manifold, but outstanding is the accumulation of data on disease and on the significance of clinical manifestations and clinical methods of examination. If no other object were in view, the conference is justified in that it exposes the limitations of existing methods of observation and therefore stim-

ulates their improvement. Were methods perfect, diagnosis would likewise be perfect. Diagnosis is the keystone of modern medicine, and effort must be continuously directed toward its improvement. — H. T. Karsner, *Atlantic M. J.* 30:49 (Nov.) 1926.

USE OF ROENTGEN RAYS IN STUDY OF ANATOMY

The anatomical laboratory is the only place where systematic roentgenographic work on the living and on the dead can be carried out side by side. Nor, indeed, is the one complete without the other. In the dead, the proteins of the body are coagulated and offer a penetrability to roentgen rays different from that of the living. Embalming still further enhances this difference. Thus it is possible to obtain roentgenographic pictures of muscles, tendons, cartilage and joint cavities in the embalmed subject which cannot be hoped for in the living. It is also possible to use long exposures with low milliamperage in the dead, and thus to bring out features necessarily obscure in the living. Therefore, roentgenology comes to have many unforeseen applications in anatomic study. The student's training becomes broad and comprehensive, for he shares in the opportunity of seeing roentgenographically such things as the results of artificial production of pneumonia in laboratory animals, the effects of low calcium or low phosphorus diet on the growth of bones. I regard the anatomical laboratory as the place where the student is introduced to normal structure, it is true, but also to deviations from the normal, thus clinching his appreciation of what properly formed and functioning organs should look like. In using roentgenography for medical instruction, there are two applications which greatly enhance its value. These are, first, the stereoscope with stereoscopic projection and, secondly, the moving picture. Stereoscopic roentgenograms are necessary in many cases, and yet, one cannot give these valuable originals to students for they would soon be spoiled. Again, they are large and cumbersome and the roentgen ray stereoscope is much too expensive to warrant the purchase of enough instruments for study purposes. It is, however, perfectly possible to reduce the stereoscopic pair to small films or plates 3" x 3" and set them up as a stereoscopic transparency for use in hand stereoscopes.—Todd T. W.: *Am. J. Roentgenol*, 16:357 (Oct.) 1926.

DISTRIBUTION OF PHYSICIANS IN RELATION TO POPULATION

In the November BULLETIN appeared an article on the Distribution of Physicians in North Dakota. In this issue appears an article by Drs. Harvey George Smith and Frederick C. Warnshuis on the same subject as related to the state of Michigan.

A comparison of the two articles indicates that the problem is fundamentally the same in both localities. Both emphasize the fact that there is no real shortage of physicians, nor is there a lack of availability hampering or inconveniencing the people. It is evident, however, that recent graduates are locating in the cities and going into the specialties in increased numbers, as a result of economic laws, public demand, the availability of hospitals, laboratories and consultants and emphasis placed on special-

ization in the medical schools.

The average age of physicians throughout the United States has increased, and the situation in the smaller communities and rural districts, where the average age is about 52 years, will probably get worse in the near future. There is, however, at the present time practically no community of 1,000 or more population without a resident physician, and a great many communities of less than 1,000 still have a physician. There is nothing specially alarming about the present situation, but many communities will shortly be without a resident physician if the current trend of graduates to locate in the cities continues. This does not necessarily mean a loss of medical service for the community, because of the automobile, the good roads and the telephone are greatly extending the radius of medical practice.

The supply of physicians in the future is entirely dependent on medical schools and at the present time the sixty-one four-year class A schools which give a generally accepted course of instruction, supply 95 per cent of the physicians of the United States. It is therefore of great importance that medical schools should have clearly in mind the future health needs of the country and the rôle which medical practice is likely to play in community life.—Editorial: *Federation Bulletin* (Jan.) 1927.

DISTRIBUTION OF PHYSICIANS IN RELATION TO POPULATION IN MICHIGAN

A statistical survey and study covering a period of ten years was made in Michigan by H. G. Smith and F. C. Warnshuis (*J. Mich State M. Soc. January*, 1927). This study covers the period from 1915 to 1925, inclusive. It included all counties of Michigan and a complete study in relation to the population of that period. It is quite evident that the ratios of doctors to population are in favor of the city. Doctors as a group outside of the city of Detroit care for 911 or 131 persons, whereas in Detroit the relationship is 615 or 491 for the respective years 1925 and 1914. The largest number of doctors are located in cities having a population of ten thousand or more. In comparing populations and the number of doctors for each group for each period 1914 and 1925, it is noted that in general where populations decrease there follows a decrease in the number of doctors, and when populations increase there is an increase in the number of resident doctors. There is a less number of doctors in rural hamlets, while there is an increase of doctors in towns of population from 2,500 to 10,000 or more. It may be assumed that by reason of the automobile and improved roads medical attendance is attainable, if not more so, than in 1914. The average age of the doctor has increased—the greater number being between 45 and 55. Educational training consumes more time and can be credited for this fact. There is a normal natural increase in the number of doctors which well conforms to population increase. The ratio of doctors to population conforms to population changes. Michigan is not suffering from lack of doctors, nor is there a lack of availability hampering or inconveniencing the people. The young doctor chooses the village for this field of service proportionately as readily as the city, providing there is a reasonable assurance of a fair living and remunera-

tion to repay expenses incurred in securing his training. At the age of 80 there were fourteen doctors in practice in 1914 and forty in 1925. In 1914 there were nineteen doctors 25 years old or younger, and in 1925 there were only fourteen.

The villages of one thousand and less population were classified by the counties in which located and the number of doctors recorded for 1914 and 1925. Thirteen counties showed an increase in the number of doctors; twenty-seven showed a decrease and twelve showed no change over the eleven year period. There were 572 doctors resident in these counties in 1914 and 489 in 1925. The number of villages that had no doctors in 1925 is twelve, and the number of villages that had no doctors in 1914 but had doctors in 1925 is three. The villages without resident doctors are located within ten miles of larger centers with one exception, a village which shows a marked decrease in population. It is twenty-miles from the nearest resident physician. Twenty-two counties show a decrease in number of doctors and decrease in population; 17 counties show an increase in number of doctors and increase in population; 3 counties show an increase in the number of doctors and decrease in population; 5 counties show a decrease in the number of doctors and an increase in population; 3 counties show no change in the number of doctors but a decrease in population. On the whole, there has been a net increase of 179 doctors and an increase in population of 212,185.

MEDICINE AND PHILOSOPHY

Professor Th. Ziehen of the University of Halle is of the opinion that in the medical curriculum should be included instruction in philosophy; that a course of lectures presenting the historic development of philosophy would be of incalculable value to a practicing physician. Likewise, he would include a practical course in experimental psychology, and for the same reason. The instruction in these subjects should be given by a physician who is well trained in philosophy or a philosopher who has the proper conceptions of medicine. Ziehen is of the former type. He is professor of medicine and philosophy.—*Deutsche med. Wchnschr.*, 52:1841 (Oct. 26) 1926.

USE OF NOTEBOOK

You should always carry a notebook, and take notes of what you see and hear. These notes, on actual examples of disease or injury, should be the most valuable of any made by you during your curriculum. They will embody what you may not at the time be conscious of, viz., your own observations, your own experience; and, if you make note-taking a habit, you will, long before the time of your "Final" comes round, be a man of experience in the various diseases of which you have seen examples. And experience is something which no one can pass on to you. You must acquire it for yourself, and, having once acquired it, you can never lose it. It will check your reading, and it will fit you to take your place at a bedside as soon as ever you are legally entitled to practice. You should from day to day compare the entries in your notebook with what you find in a standard textbook. See what may have been absent in the cases you have seen, and see also what the textbooks may have missed.

Never lose a chance of checking your clinical experience by a postmortem. You will not often have the opportunity in private practice. Therefore make the most of it while you are students of the hospital. Keep notes of what postmortems you attend, more especially if you have seen the patient in life.—G. H. Edington: *Glasgow M. J.* 25:24 (Jan.) 1927.

THE MAKING OF A DOCTOR

During this modern era there has been a decided tendency on the part of Boards of Control to, in a great part at least, turn the medical schools over to the "Great Foundations" in return for endowment funds, and said "Foundations" immediately place the school in the hands of professional educators, perhaps the majority of whom have never practiced medicine a day in their lives and many of them have never studied medicine at all and have no medical degree, and yet these men determine the kind, character and amount of the work that must be done to obtain a medical degree. Is this altogether the best plan? In the medical profession we have men who have risen to positions of honor and scientific eminence, men who have spent their lives in the actual practice of the various branches of medicine. Would it not be a good plan to invite such men to a seat in the council chamber? In the humble opinion of the writer, every man who teaches in a medical school should be a graduate in medicine. I will go further—he should have a keen interest in, and a love for practical or clinical medicine. He should come down and mingle and work with the clinical men. He should spend part of his time in the wards of the hospital with the clinical men in order that he might study symptoms and problems with them in an endeavor to turn his own scientific knowledge into channels that will assist in the solution of actual clinical problems. This plan would serve to cement and unify the whole teaching force. Their objective would be a common goal. Their understanding would be complete. Laboratory methods have been fostered, accentuated and pushed by medical teachers in the last few years. The accuracy, the scientific trend, the relationship to research of the method, etc., have all been favorably placed before medical students. Consequently there is a tendency to look upon laboratory methods as "a short cut," "sure shots" and "exact methods." Many medical men have lost interest in physical examinations and are liable to discredit same. Medical men in general are manifesting a tendency to lean on laboratory procedures for diagnosis. As a natural consequence of this overstressing of laboratory methods we find that our medical students and younger practitioners are afraid to venture a diagnosis on a given case until all possible laboratory procedures are finished and reported. The laboratory men tell us that medical men and students should know more about laboratory methods. We might very justly retort by saying that laboratory men should know more about patients. The importance of the laboratory in the general scheme of medical education is being rather over-estimated, while history taking and the proper utilization of the physical senses in obtaining evidence of disease are being neglected. The possession of technical, mechanical skill is not a substitute for the thinking

process. The laboratory can never take the place of clinical study.— W. A. Jenkins: *Kentucky M. J.* 25:4 (Jan.) 1927.

SPECIALISM IN MEDICINE

Overspecialization is one of the outstanding faults of modern medicine In our medical schools of today a large per cent of the senior class have already selected their specialties. The young graduate either starts practicing as a specialist or he takes a six-weeks intensive course and then launches out as a specialist. We now have specialists for almost every organ and structure of the body. The country is flooded with wet diploma specialists. We are constantly splitting off specialties from the parent stem "general medicine." There are several reasons for this state of affairs. A specialty generally means a greater income, more reputation, and the work is less arduous. Again, specialism is especially stressed in teaching medical students. In all of our medical schools we have a large number of specialists and each one of them is clamoring for more hours to be devoted to his specialty. Each one of them tends (perhaps unconsciously), to isolate and magnify the work which he is doing; a certain glamor surrounds the work. The impression is created that only a few men can do this particular work. It is superior to ordinary medicine. He tends to make specialists in his line of the students. Thus the specialties become separated from general medicine. They are taught in such a way that they tend to become independent, when in reality they should be interdependent. Every specialist who is a teacher in a medical school should have as his chief object the idea of making his specialty fit into and become an integral part of general medicine. In his teaching he should simplify rather than magnify. He should correlate rather than isolate. He should make his subject as simple as possible for the student. He should teach the student to do just as much of his type of work as it is possible for the general practitioner to do, safely. Of course, he should also teach the student to recognize his own limitations in order that he might be able to make the diagnosis at the proper time, and refer the case to an individual possessing the requisite technical skill (where such is required). As the matter stands today, if a man gets tired of general practice he "Takes up" surgery. He begins to do all his own surgery, and forthwith becomes a surgeon. A man who is too lazy or too incompetent to do general practice goes to London or Paris, stays a while and finally comes back with a piece of machinery and "elects" himself a specialist. The public and, strange to say, even many of the doctors themselves have fallen under the sway of this false sophistry. In our large communities of today we find the laity going to the specialists. The method of becoming a specialist should be prescribed by the medical schools and the doctors themselves and if this is not sufficient or possible, then it should be made a matter of legal enactment and the laws placed upon our statute books. Every man who graduates in medicine should be required to spend a period of at least five years (and ten would be better), in a general practice. The object of the average medical school should be to produce good general practitioners. The making of specialists is first of all dependent on a particular preparation and fitness on the part of

the doctor, as shown by actual practice, throughout a period of years, and second, a matter of special preparation in postgraduate schools and hospitals, the candidate taking a definite and prescribed standardized course. I am going to make a rather broad and sweeping statement, and I make it without the least fear of successful refutation. It is this. When it comes to medical matters, the best guide that the individual or the family as a unit of our population can have today is the competent first-class general practitioner. Such a man will be able to recognize and successfully treat over ninety per cent of our ills and he will be able to do this with only a minimum of costly laboratory tests. When the services of a specialist become necessary he is still the best guide, because he is on the inside and he knows who is really a specialist, and he immediately sends or takes his patient to the proper man. And he again takes charge of the patient after the special procedure has been instituted. — W. A. Jenkins: *Kentucky M. J.* 25:9 (Jan.) 1927.

MEDICAL RESEARCH

Curiosity alone will not make more than a laboratory dabbler, a dilettante of science. Many other qualities must be added to make a worthy researcher. Knowledge, both wide and deep, of his subject and of related sciences is needed to fit him for his work to help him to surmount the difficulties with which the paths of science are so liberally sprinkled. Coupled with this need of knowledge is the need for technical skill and the ability to work neatly and accurately. These can, save in exceptional cases, be cultivated to a reasonable extent if not naturally present. They may not be essential, but they do greatly facilitate his work.

Patience is an essential virtue for the researcher. A fiery impetuousness may keep a man at work for twenty hours a day for a week or so. In that time the copingstone may be set on his work, but the patience which keeps the worker at his bench in the laboratory for eight hours a day for months at a time is what has done most of the advancement of science. This same patience, when the error in his previous work has been discovered, enables the worker to commence once more at the beginning, it forces him to repeat the same experiment again and again until the result is constant, and it urges the undertaking of new experiments so that his conclusions may be quite beyond criticism. Every research worker must have genius, if we define as genius an infinite capacity for taking pains. He must devote almost unlimited care and attention to even the smallest and apparently most insignificant details of his work, for it is often in the little things that error arises. Allied to patience is the stubbornness and determination not to be beaten by the difficulties of the problem until these have been overcome or until it is realized that the problem is insusceptible of solution in the present state of our knowledge. The true scientist is constantly insisting on controls. Every variable factor must be controlled if any deductions derived from the experiment are to be of value. This need for controls and the neglect of them by those engaged in clinical medicine afford an explanation of the suspicion with which the laboratory worker regards many of the deductions of his clinical colleagues. Fundamental research is

concerned purely with the scientific interest of the matter partly with the application of science to medicine or industry. One cannot always keep the two apart, as they merge into each other to so great an extent.

One of the commonplaces of research is the importance of luck in aiding research. The apple which fell on Newton's head, and the kettle lid which, dancing on the steam, suggested the steam engine, may be legendary, but we have many well authenticated examples. The frog's limbs which contracted when Galvani hung them from an iron bar with a copper hook led to all our knowledge of electricity; the deflection of the magnetic needle when a wire carrying a current was held over it suggested the telegraph to Oersted; the failure of a lecture demonstration pointed the road to Meyer's discovery of thiophene; the culture of the organism of chicken cholera which, after Pasteur's holiday, did not kill fowls but protected them from later inoculation with virulent cultures, paved the way to immunization. All these were merely lucky accidents; but accidents happen to all of us, while it is reserved to the few to make discoveries.

The worst combination, from the point of view of research, is the college laboratory when routine diagnostic work is undertaken, either to add to the funds of the college or to augment the entirely inadequate salaries of the staff. This state of affairs is found chiefly in laboratories devoted to pathology and bacteriology, which have a closer connection with clinical medicine than have any of the other branches of academic medical study. In many such places research is well-nigh an impossibility, and the condition is so serious as almost to constitute a scandal. University professors or lecturers in other subjects are not expected to, or are not forced to, augment their salaries in this way, but it is almost the rule in pathology and bacteriology, and presents a serious and real bar to progress in these subjects. The combination of either teaching or routine work is not incompatible with research so long as a fair share of the day is genuinely free for research.

The medical research worker has gone through a long and expensive training both as a student and as a graduate; he has difficult and trying work, and has to contend with various drawbacks and difficulties. What are his rewards? Concerning those in some future state, we cannot say; but, if they are to balance those which he has missed here, they should be considerable. Here he may obtain great honor and renown and, what true scientist values most, the admiration and respect of the small band of fellow workers who are able to understand his achievements. Beyond that, he is lucky if he is just able to live. It is pitiable to see, in case after case, the passing around of the hat to render life possible for the widows and children of distinguished scientists who have given their lives for their work. That this should be necessary is a disgrace to our vaunted civilization. It has to be done, not because such men are reckless or prodigal, but because they are forced to live at a certain level on totally inadequate incomes. — Bigger J. W.: *Irish J. M. Sc.* 6:26 (Jan.) 1927.

SHORT ANSWER TYPE OF QUESTIONS IN BACTERIOLOGY EXAMINATIONS

The grading of the tradition essay type of examination is both very time-consuming and highly subjective and unreliable. The grades assigned by 142 teachers to one paper varied from 51 to 97, and the grades assigned by 114 teachers to another paper ranged from 28 to 91. It is also found that when a paper is re-read by the same teacher after a lapse of six months or more the paper is not infrequently evaluated as much as ten points high or lower than on the former occasion. Such being the handicaps of the traditional examination, it is not surprinsing that attempts should be made to devise an examination that yields the same results regardless of where it is given, by whom it is given, or when or by whom it is graded. Experiment shows that examinations cast on the short answer type of question most nearly fulfill these requirements. The short tests contain a large number of items, and permit a much wider sampling of the students' information than is true of the essay examination. As the answers are controlled and are either definitely right or definitely wrong, bluffing is prevented, and at the same time all such extraneous factors as handwriting, spelling, grammatical errors, and other incidental things that seriously impair the validity of the essay type of examination are eliminated. The short answer tests are so constructed that the grading is purely objective, and a paper with 300 questions can be graded in ten minutes with perfect accuracy by a clerk, even though he knows nothing about bacteriology. In order to compare the relative validity of the short answer and the essay types of examination, both types were subjected to the following test in the George Washington University Medical School. The students were given a three-hour examination consisting of ten questions in the traditional essay form. A short answer examination which consisted of approximately 300 questions and which required one hour and a half to administer were also given. A practical examination was given in order to establish a criterion against which to check the validity of the other two types of examination. The correlation between the students' grades on the three-hour essay examination and the scores on the practical test was only 0.24. But a correlation of 0.74 was secured between the scores on the short answer test and the scores on the practical test. These correlations indicate that as an instrument for determining an individual's knowledge of bacteriology the short answer test is a very valid and useful measuring device, and that the traditional examination indicated the relative ability of the students not very much better than would an alphabetical arrangement of their names.—Oskar Hunter: *J. Bacteriology* 13:70 (Jan.) 1927.

TEACHING BACTERIOLOGY IN COLLEGES OF LIBERAL ARTS

The development of the subject of bacteriology for the beginner is believed to be accomplished most satisfactorily by introducing each new phase of the subject by: (1) a preliminary lecture, explanatory in nature; (2) by the outlining of a series of simple laboratory experiments for the student so as to bring out the phases of bacterial activity being studied; (3)

by assigning suitable reading on the particular phase of the subject in different textbooks; (4) by trips to manufacturing plants where similar phases of bacterial activity may be observed on a large scale, and (5) by a conference or review with the class to ascertain whether all the students have obtained the desired information. —D. H. Bergey, University of Pennsylvania. *J. Bacteriology*. January, 1927.

TRAINING FOR PUBLIC HEALTH WORK

A new scheme is being worked out in Smith College, the purpose of which is to prepare definitely for further training in public health fields. This consists in a definite group of courses in chemistry, zoology and bacteriology for a student choosing this plan instead of the usual major in a single department. After the completion of her college course, the student is ready to pursue either a medical course, a graduate course in a school of public health or to enter a laboratory. This scheme presents certain important problems such as: The number of courses in bacteriology which should be required; the content of these courses, the prerequisites for introductory and advanced courses; the amount of chemistry which should be required. The content of the courses involves many problems concerning not only the subject matter itself, but the best methods of presenting it Should there be lectures, discussions or recitations and what proportion of the time should be devoted to them? The content of the course as limited by the time at the instructor's disposal is also a serious factor.—E. F. Genung, Smith College, *J. Bacteriology*, January, 1927.

BACTERIOLOGY A CULTURAL SUBJECT

The special claims of bacteriology as a cultural subject are briefly, as follows: (1) The subject matter covers an enormous range; from the ultramiscroscopic cell to the sun; from the helpful organisms in the soil under our feet feeding upon nitrogen to the human disease organisms demanding hemoglobin for their food, etc. (2) The single living cell as the basic unit of living organisms is more nearly grasped in microbiology; in a short space of time we may study in many succesive generations of individuals morphologic variations, physiologic processes, environmental effects including food relationships, etc., with a sequence of measurable changes showing that these living units must be in a highly plastic state —the one important condition of living protoplasm. (3) Our appreciation of and adaptation to the world we live in demands a general knowledge of bacteriology, including methods of disease transfer, the principles underlying disinfection and quarantine and such economic problems as our plant food supply, from production to spoilage and its prevention. (4) Bacteriology has many direct personal applications. The subject matter as taught does not necessarily grow more complicated as it becomes more varied, and as a "required science" it can almost be counted upon to arouse interest in students who "resist" physics or chemistry. (5) The history of bacteriology is a closely interwoven network of physics, chemistry and biology; its sequences are logical and marked by applications of importance, often of intense human interest. (6) Last, but not least, the laboratory work can be kept simple in

character, so that the illustrative values are not lost in technic.—Jean Broadhurst, Columbia University. *J. Bacteriology* 13:69 (Jan.) 1927.

EXTRAMURAL TEACHING IN WISCONSIN

With the establishment of a full four-year course the University of Wisconsin has been able to put into operation a method of teaching which marks an epoch in medical education. The fourth year of the medical course will extend over forty-eight weeks. During this period students will spend about half the time at the Wisconsin General Hospital and half the time in extramural service. In this extramural service small groups of from one to three students work under the supervision and direction of extramural preceptors. The extramural preceptor is responsible for the instruction of the students under his supervision during the period the students are assigned to him; he prescribes and directs their studies, and is responsible to the faculty of medicine for these students, and reports to the proper committee of the medical faculty as to their progress and ability. Each student is assigned to one service extending over three months and of several shorter services. This departure in medical teaching should have a very stimulating effect on the hospitals and their staffs where these students work. The staff will be under constant observation of bright, well trained students, critical in their attitude and quick to notice short-comings, either in proper investigation of patients or careful recording of the conditions observed. This will cause a healthy competition and be a stimulus to the various centers to which students are sent. It will thus inevitably improve the standard of medicine in those centers and in the territory about. It is hoped that, as the plan is developed, other centers qualified to teach those students will be added to the list now designated until the whole state of Wisconsin is covered with extramural teaching centers. This plan demands that the student be of a high type and that the fourth year class be limited in numbers on the basis of intelligence and scholarship. It requires also that those taking the responsibility for training students will give them more than passing attention. The preceptor must be prepared not only to prescribe reading and investigation, but also to give time to supervise such work as prescribed. The supervision in each instance will fail in great degree if he does not enlist the sympathetic cooperation of every member of the hospital staff, qualified by training and enthusiasm to assist in this teaching. Ed: *Wisconsin M. J.* 26:35 (Jan.) 1927.

PERILS OF MAGNANIMITY

In the minds of many who are in touch with medical institutions, a feeling of apprehension is being aroused by the progessively increasing dependence of a great educational system upon one or more centrally controlled funds. And since, in our opinion, this apprehension is based on more than the unworthy caution of suspicious natures, we believe that it should be aired in frank discussion instead of being allowed to ferment in the dark corners of vague and irritated criticism. It is true that the criticisms to which we refer are often based on differences of conception in

which our own judgment inclines us to side with the foundations. And it may also be said that much of this criticism emanates from sources which have failed to obtain some of the money. On the other hand, we believe that, if one searches below the surface, the basis for dissatisfaction, often not clearly understood by the critics themselves, may be found in a foreboding that the guidance of medical education is to a considerable extent passing out of the hands of the universities themselves into the hands of a permanent or, at any rate, self-perpetuating body of gentlemen who, by the very force of the established relations, cannot help extending their influence over all the important centers of American education. They have devoted laborious and conscientious years to the development of sound medicine—thoughtfully, with study and contemplation. When they hastened the death of some of the obviously inferior schools and formulated policies of progress for the others, they liberated American medicine. They have ridden their lances into many dragons—but also into a number of windmills. We may grant—indeed, it seems to us quite self-evident, because of the nature of the relationship—that the purpose of the responsible governing bodies is solely to spend as much as possible of the available funds, as rapidly as is feasible, for the greatest good.

It is inevitable that such boards must be besieged by requests for sums far greater than the endowments they administer, a considerable proportion of which could not be granted without unpardonable laxity in the spirit of trusteeship. Ergo, it has been necessary to have on hand one or more individuals who are constantly studying the problems involved in the development of medical institutions and who can give expert opinions in individual instances. Such experts, therefore, must form opinions, and —naturally—must adhere to them after they have obtained all the information possible. Immediately we have a situation. The expert and his board have opinions. They also have money. The universities, too, have opinions; but often no money; never enough. The trustee-experts with the money—in all honesty, we are convinced—disavow the desire to impose their own views upon the organization of the medical schools. But, if they do not approve of such organizations, their methods, or intentions, how can they conscientiously give the money? The medical schools, on the other hand, need the money very badly. Often—we know of such cases—their existence may depend upon the control of a hospital; the possession of a laboratory building. They may have convictions of one kind or another, and they may—perhaps wrongly— believe that a certain procedure is peculiarly suited to their traditions, locality, or what not. But the temptation is great to adjust in the direction that will lead to the needed assistance.

The point is not who is right about this and who about that; but rather: Does the system which was necessary to achieve the indisputable good so far accomplished carry with it into the future an inevitable uniformity of educational methods; does it inevitably diminish local initiative in educational experiment; and does it, or does it not, by all these tokens, by its very uncontrollable evolution, lead to the establishment of a hierarchy of opinion on matters which, of all

human endeavors, are the ones for which freedom of development is most necessary? The question is not: Is the vast benefit accomplished worth the risk? But the question is rather, for the thoughtful: Is the great conception in danger of losing effectiveness? Are there growing indications of an influence, well-intended and so far highly beneficial, which is formularizing our medical educational system by a uniform standard and subtly imposing the beliefs—however wise—of a single group?

Some see in the situation the sinister tentacles of the octopus reaching for power. The situation is much simpler than that, and less dramatic. There is merely a group of conscientious and well-informed gentlemen who have taken over the arduous duties and responsibilities in connection with a fund which they are trusted to spend wisely and without too much delay. They are guided by a capable scholar who has made himself one of the foremost lay students of medical education. They are beset by a clamor of requests which it is their duty to gratify in so far as they properly can do so. Many of these requests are wise, some of them are less wise, others not wise at all. The trustees have wrought mightily by the only method possible when the field was rough, stony, and full of weeds.

The situation that has arisen is not of their making—surely, we believe, not desired by them. But if it exists, why not face it before it has done the harm which may not easily be undone? If higher education is to develop in a wholesome manner, it must be free to follow many paths, to experiment in many directions—if necessary, to make its own mistakes. The universities are the normal guardians of educational progress. Their organizations and their considerable resources in expert opinion and educational experience entitle them to autonomy of decision, both as to policy and as to details of method. Limit them in this regard, and the future will inevitably pay for it. Left free, they may commit errors, fall behind, or even remain—for periods—unmindful of their obligations. But in the long run they will make progress, impelled by the varying problems they encounter, or by the enthusiasms of the particular brand of educational progressive who happens to gain local influence. At any rate, they will remain individual and independent of guidance by a sort of superacademic general staff.

But we note that similar developments have completely avoided in the world-wide activities of the International Health Board, and it would appear to the observer a simple matter to eliminate them completely from the educational program of the foundations by a relatively slight adjustment to recent changes in the management of medical schools. It is not reasonable to hope that future donations may be determined purely on the basis of demonstrated needs and bestowed for definite purposes, leaving of details of procedure and organization entirely to the governing bodies of the beneficiary institutions? Surely this would be safe in most cases, and would eliminate irritation and the apprehensions we have mentioned from a relationship which should be one purely of gratitude for great benefactions.—Hans Zinsser: *Atlantic Monthly*, February, 1927.

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